Case #121

NAME Educational Activities Committee

Case provided by:

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A 61-year-old man was found dead in his secured residence. Autopsy revealed the finding shown in the photo. At the scene of death, there was/were:

A. Multiple empty alcohol containers

B. A white powdery substance and syringes

C. Multiple empty spray paint cans and rags

D. An empty anti-freeze container and a suicide note

E. A malfunctioning propane heater

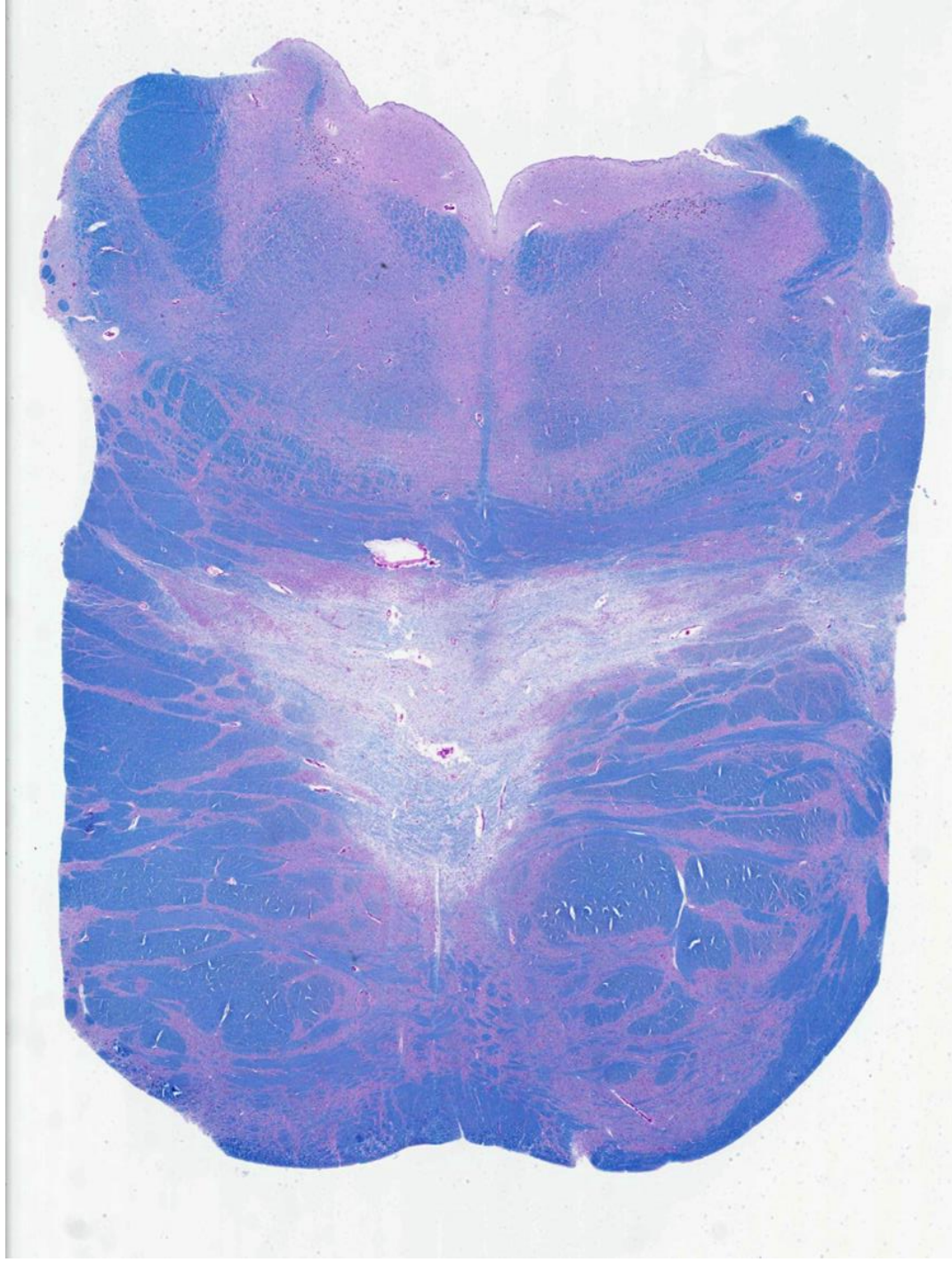

CM
1
2

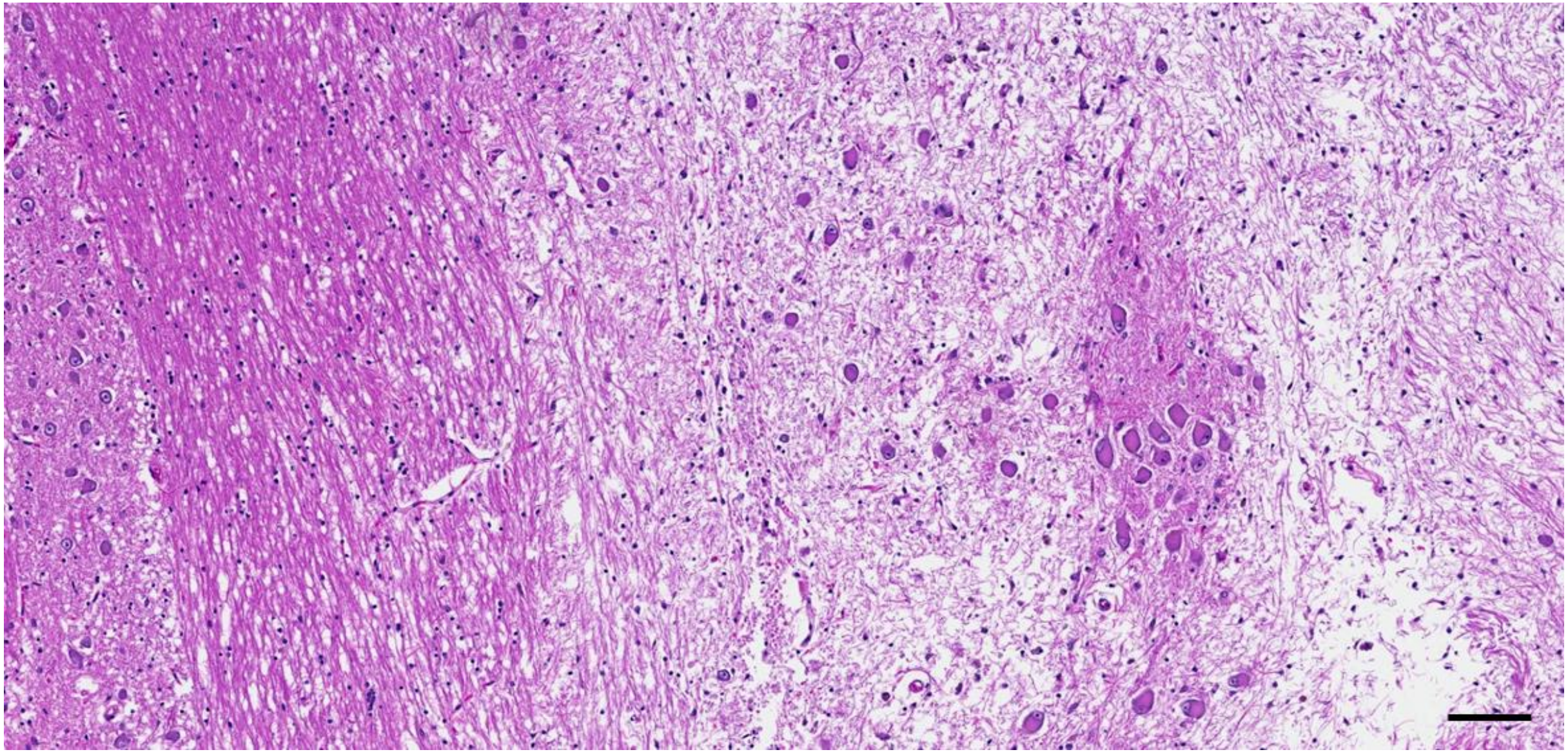
Correct answer...

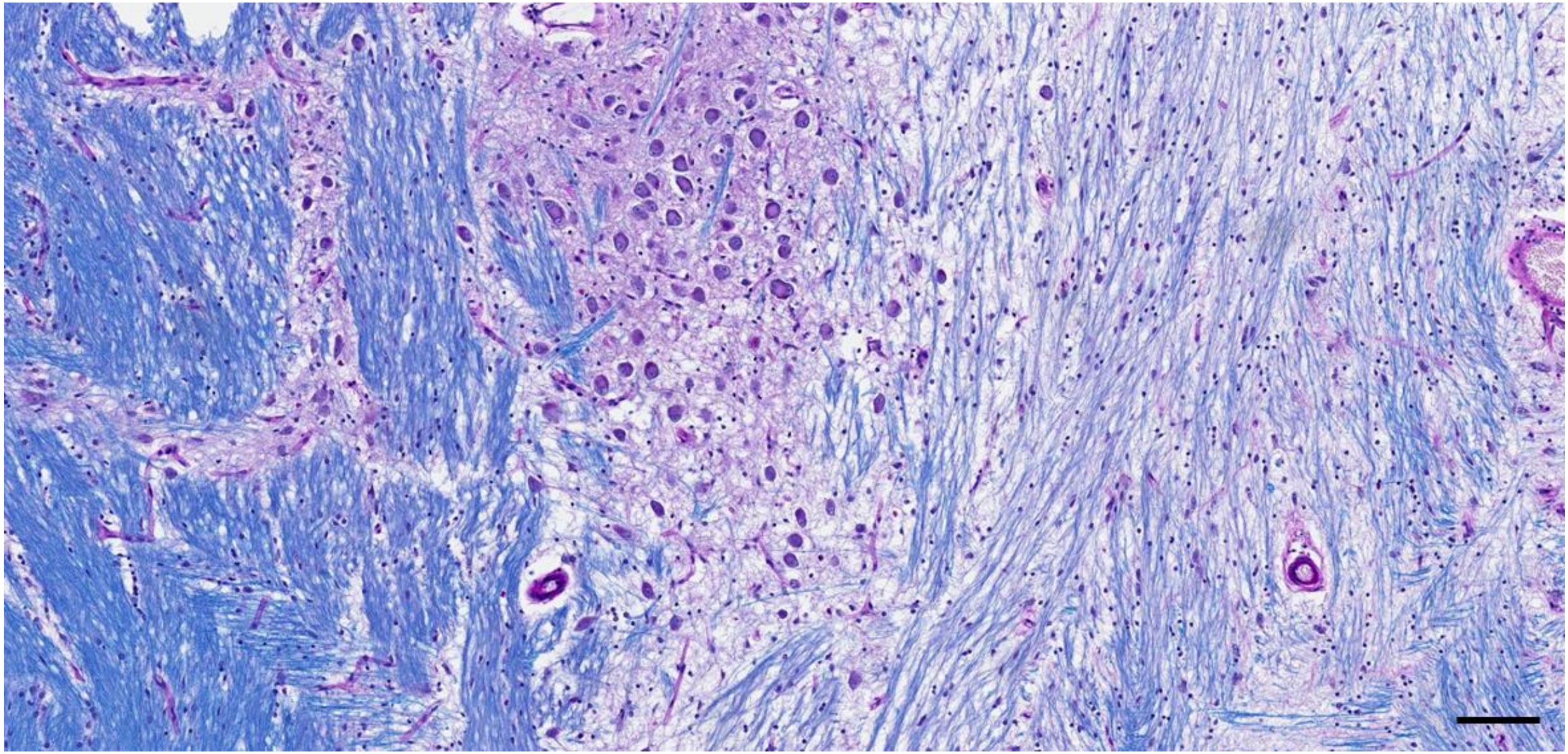
A. Multiple empty alcohol containers (CORRECT ANSWER – 64.58%)

The gross image shows an axial cross section of the pons with a grayish and softened lesion in the center of the basis pontis.

The lesion shown on H&E and LFB-PAS staining is a classic example of central pontine myelinolysis (CMP), with a “bat-wing” pattern of myelin loss, extending outward from the midline. Microscopically, there is myelin and oligodendrocyte loss with relative preservation of neurons and axonal processes, without prominent lymphocytic infiltrate. In acute to subacute cases, axonal swellings may be present. Most commonly, CPM is caused by the rapid correction of hyponatremia. It is highly associated with chronic alcoholism and can also occur in those with normal sodium levels. It is also associated with liver transplantation and malnutrition. Clinical manifestations include encephalopathy and motor deficits of dysarthria and dysphagia.





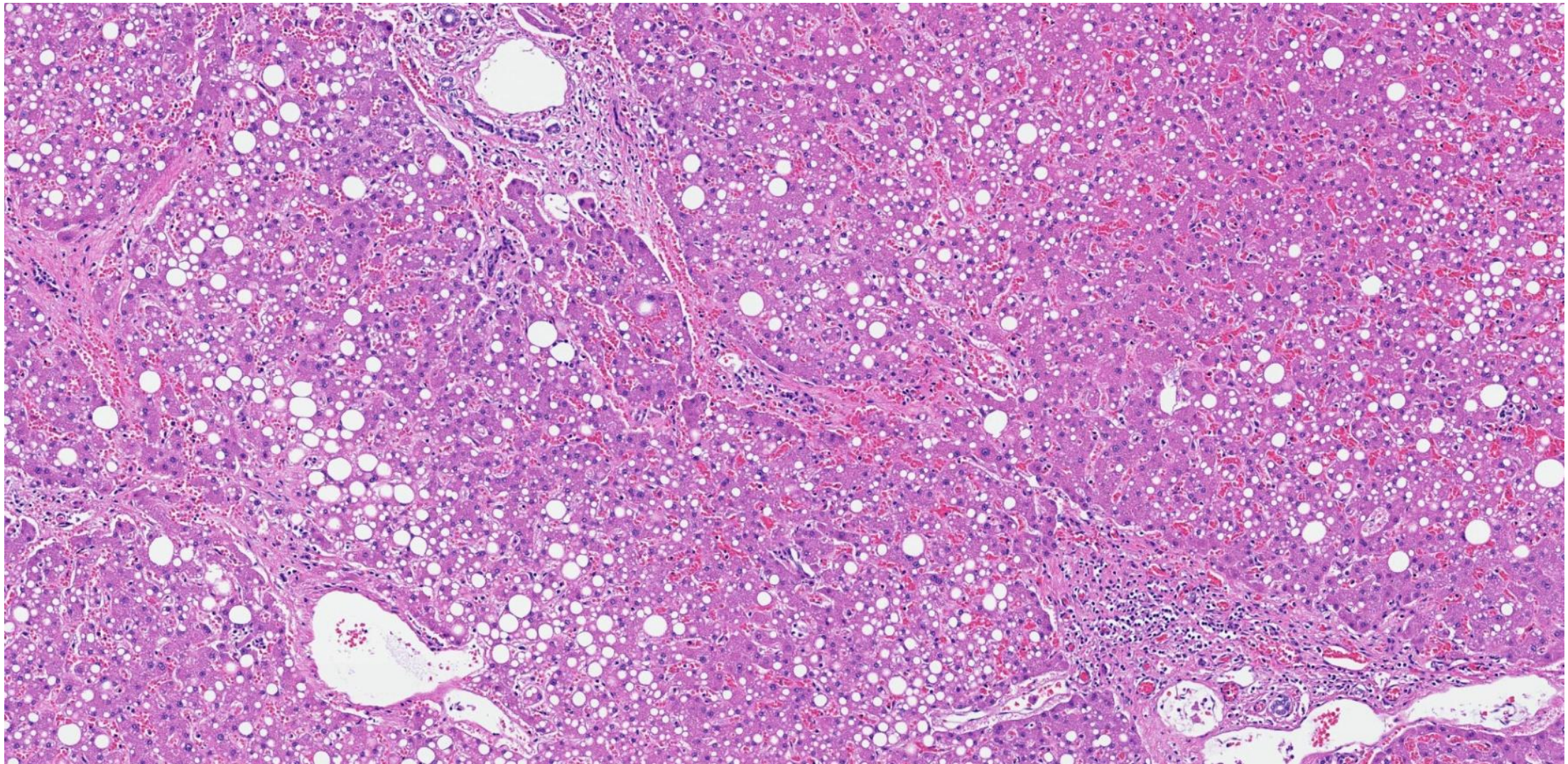


Scale bar = 100 μm

In this case, the decedent had a history of ethanol dependency and related pathology was discovered at autopsy.

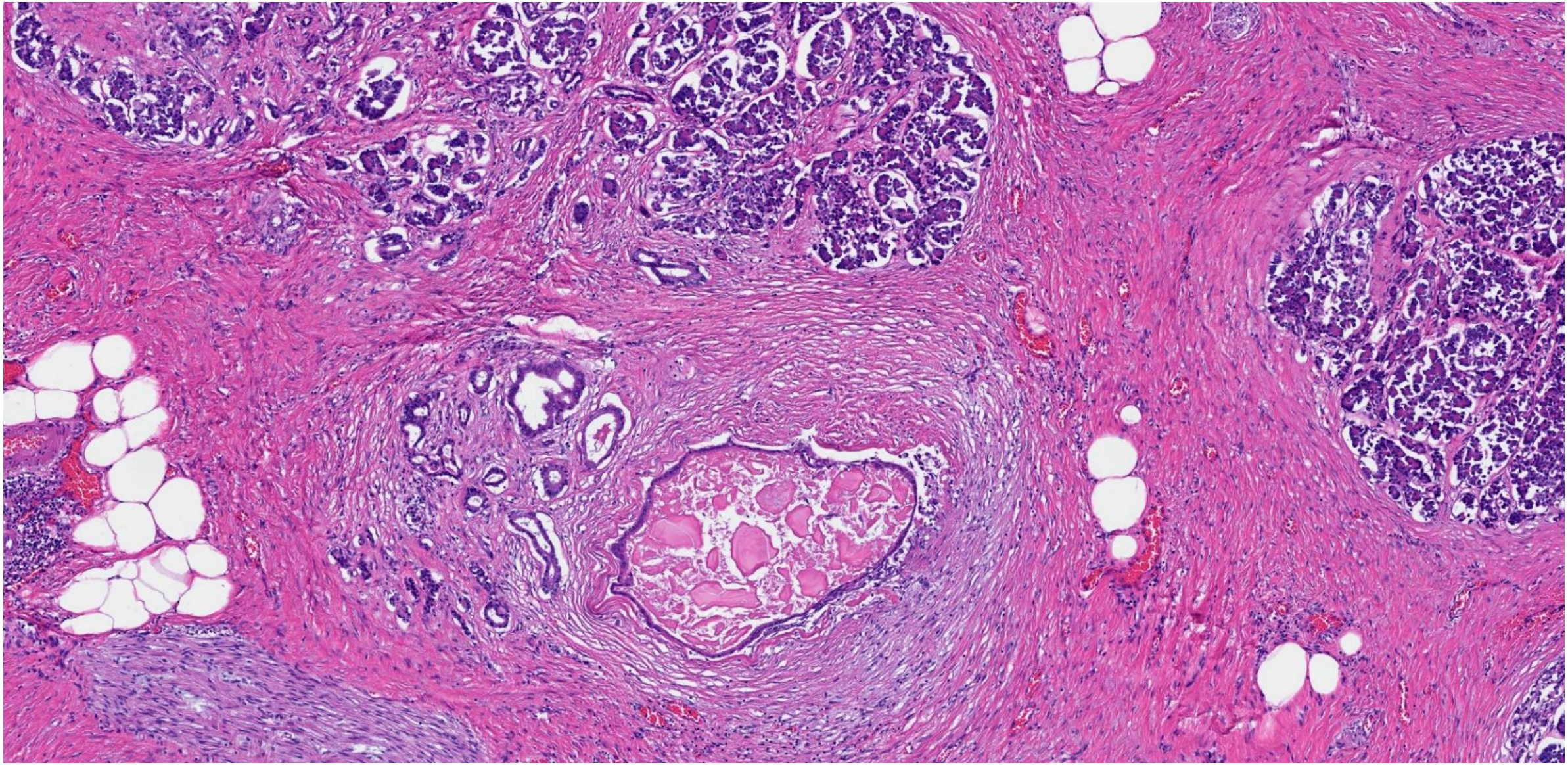
Other findings included:

- Hepatic steatosis and portal fibrous bridging, suggestive of early cirrhosis



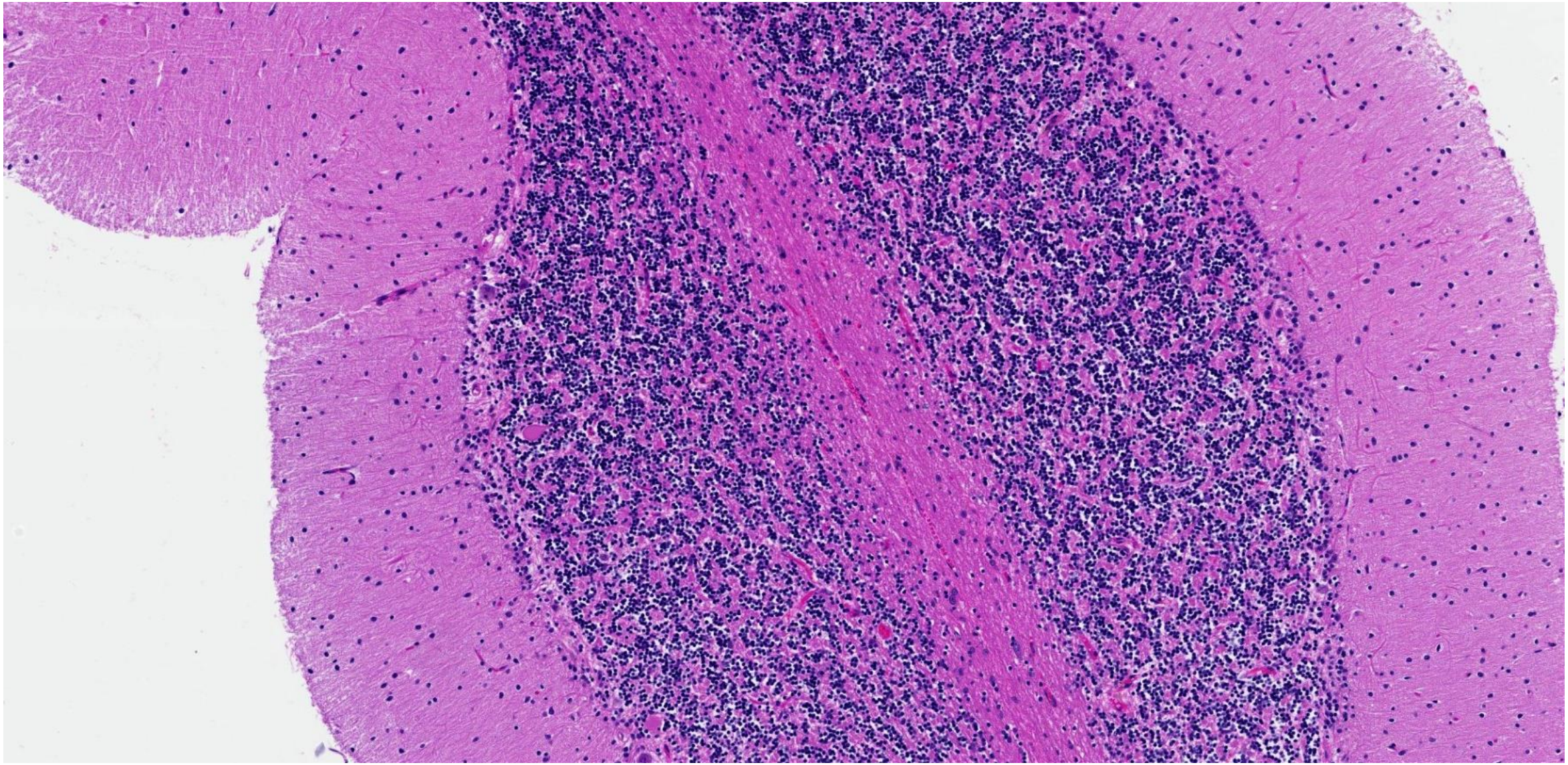
Other findings included:

- Chronic pancreatitis, with diffuse fibrosis, loss of acinar tissue, and ductal protein plugs



Other findings included:

- Cerebellar atrophy with prominent Purkinje cell loss and concomitant Bergmann gliosis



B. White powdery substance and syringes (INCORRECT – 4.17%)

Illicit drug toxicity is associated with cerebral edema and vascular brain injury. Stimulants, such as amphetamines or cocaine, cause increased blood pressure, which can lead to intracerebral hemorrhage due to vessel rupture, or stimulant-induced vasoconstriction leading to cerebral infarct. At autopsy, opioid-related deaths may have cerebral edema, with increased brain weight and evidence of herniation. Hypoxic-ischemic injury, with necrotic, “red”, neurons involving the hippocampal formations and Purkinje neurons are also common.

C. Multiple empty spray paint cans and rags (INCORRECT – 9.38%)

Inhalation of volatiles from paints and glues leads to exposure to toluene, an organic solvent commonly found in household items. Due to the highly lipophilic nature of toluene, vapor inhalation abuse can manifest as a toxic leukoencephalopathy. Microscopically, there is damage to white matter with demyelination greatest in the cerebellum and periventricular cerebral white matter, with sparing of the U-fibers, and neuronal preservation. Toxic leukoencephalopathy has also been reported in cases of heroin vapor inhalation.

D.An empty anti-freeze container and suicide note (INCORRECT – 8.68%)

With ethylene glycol ingestion, the active ingredient in anti-freeze, autopsy findings involve the kidneys and central nervous system. Ethylene glycol metabolites ultimately form calcium oxylate crystals, which preferentially accumulate within renal tubules and cerebral vessel walls, in both the meninges and brain parenchyma. These irregularly-shaped crystals appear translucent to lightly basophilic and are strongly birefringent under polarized light.

E. A malfunctioning propane heater (INCORRECT - 13.19%)

A faulty propane heater can lead to carbon monoxide toxicity. Neuropathologically, this manifests as selective hemorrhage and necrosis of the globus pallidus. These lesions can be asymmetric and grossly cavitary. Scattered petechial hemorrhages within the subcortical white matter have also been reported. Necrosis of the pallidum can also be seen in cyanide and methanol toxicity. Rarely, carbon monoxide toxicity can lead to a delayed demyelination process referred to as Grinker's myelinopathy.

References:

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