



An Introduction to the Brain Autopsy

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Case-Based Questions (please see page 4 for answers)

1.	An elderly gentleman with a history of falls is found down at home. Although resuscitation is attempted, he is pronounced dead after arriving to the local hospital emergency room. The patient's family requests an autopsy inclusive of the brain. At the time of brain extraction, what gross finding would be in keeping with this gentleman's history of falls?
a.	Acute subarachnoid hemorrhage
b.	Chronic subdural hematoma
c.	Lobar superficial hemorrhages
d.	Subdural empyema
2.	A motorcyclist is involved in a hit and run and dies. On brain exam, what gross finding would be an artifact rather than a finding related to the decedent's injuries and/or cause of death?
a.	Epidural hemorrhage
b.	Multiple smooth-walled cavities within the cerebrum and cerebellum
c.	Petechial hemorrhages in the corpus callosum
d.	Punctate areas of hemorrhagic softening over the brain surface
3.	An elderly woman walks daily but begins to have trouble finding her way home. She has lived in her home for many years and her neighbors know her well; they guide her home. This continues for several years before she dies during a hospital stay. What brain autopsy gross finding would support the family's suspicion that she had Alzheimer's Disease?
a.	Generalized cortical atrophy
b.	Hemorrhagic lesions of the basal frontal lobes
c.	Loss of pigmentation in the substantia nigra
d.	Symmetric demyelination in the basis pontis

4.	A pregnant person with no history of prenatal care suffers an intra-uterine demise during their third trimester and requests an autopsy. Removal of the brain reveals a macerated specimen. After formalin fixation, the brain is in large segments. How can we use the brain to attempt determining development in this decedent?
a.	Attempt to reconstruct the brain for comparison to known gross development patterns
b.	Compare the weight of the specimen to published tables of known brain weights during development
c.	Dating gestational age is not possible in this specimen
d.	Take sections of presumed cerebrum and cerebellum in an attempt to correlate neuronal migration with known patterns by date

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Correct Answers and Rationales

Question 1 Correct Answer and Rationale: **B. Chronic subdural hematoma.**

Rationale: Subdural hematomas are usually caused by rupture of subdural bridging veins. Especially in the elderly, they can occur after relatively trivial trauma. The blood moves freely in the subdural space and may cover a whole hemispheric convexity. In acute cases, the blood clot is semi-liquid, sliding off the dura at autopsy. After a few weeks, the clot hardens and becomes encapsulated within a membrane. A slow resorption process follows. An elderly person with a history of falls has multiple opportunities to acquire a subdural hematoma. And acute subarachnoid hemorrhage is consistent with a history of sudden onset severe headache sometimes with nausea, vomiting, stiff neck, vision problems, and/or loss of consciousness. Lobar superficial hemorrhages are usually secondary to cerebral amyloid angiopathy; affected vessels are confined to the leptomeninges and cortical gray matter. The patient does not appear to have a history of skull base sepsis or encephalopathy, so a subdural empyema is unlikely. This patient was found down, so the immediate cause of death is unclear from the question stem.

Question 2 Correct Answer and Rationale: **B. Multiple smooth-walled cavities within the cerebrum and cerebellum**

Rationale: Also called swiss cheese artifact, this artifact is caused by gas-forming organisms that continue to multiply after the death of the individual. Answers A, C, and D are all findings that could be secondary to trauma from the hit and run accident.

Question 3 Correct Answer and Rationale: **A. Generalized cortical atrophy**

Rationale: Generalized cortical atrophy is a hallmark gross finding of Alzheimer's disease. Hemorrhagic lesions of the basal frontal lobes can be due to many causes, among them rhinocerebral mucormycosis (classically seen in diabetic ketoacidosis). Loss of pigmentation in the substantia nigra is seen in dementia with Lewy bodies and in Parkinson's Disease. Symmetric demyelination of the basis pontis is the key finding for central pontine myelinolysis (osmotic demyelination syndrome).

Question 4 Correct Answer and Rationale: **D. Take sections of presumed cerebrum and cerebellum in an attempt to correlate neuronal migration with known patterns by date**

Rationale: Given the macerated state of the brain, portions may have been lost during removal, leading to an inaccurate brain weight. Reconstruction of the fixed brain in this state is similarly fraught with inaccuracy; baby brains are quite delicate even once fixed, so there is a high likelihood that attempting reconstruction grossly would further fragment the specimen. However, histologic examination of the brain shows the patterns of neuronal migration even in somewhat macerated specimens such as this one.