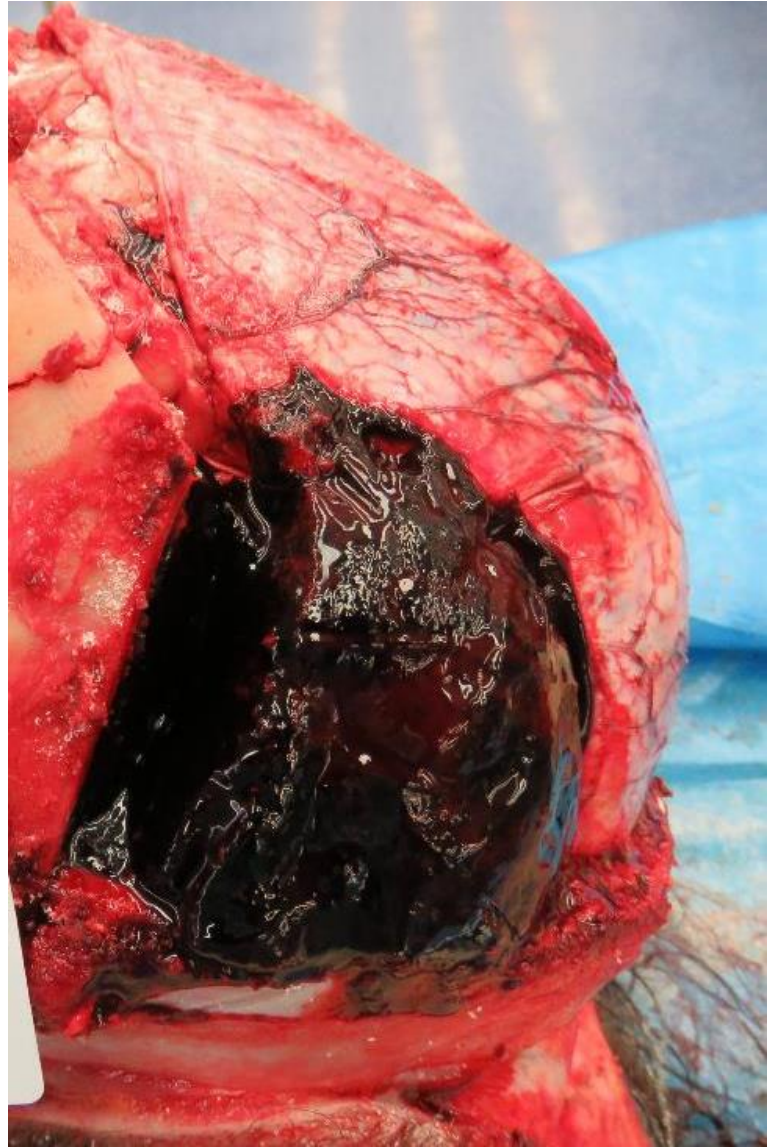
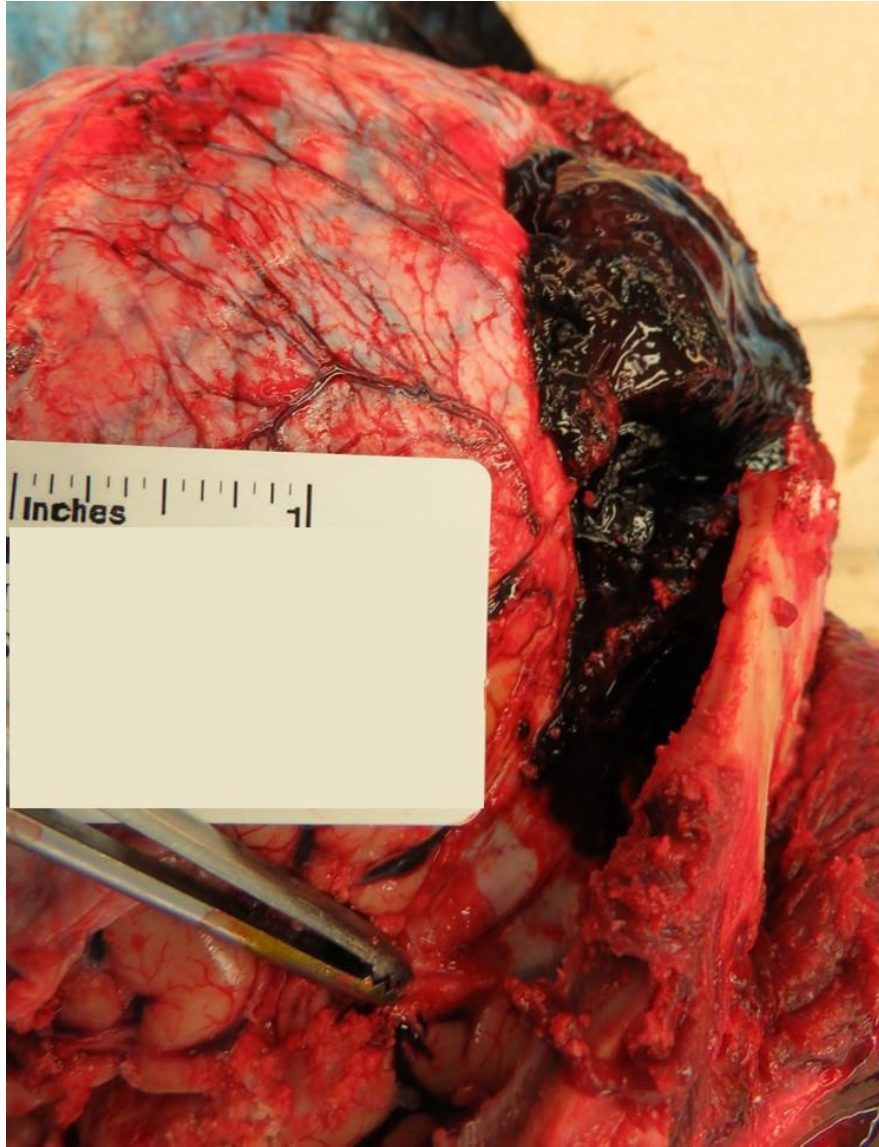




# Case #65

NAME Educational Activities Committee



This finding at autopsy is most likely a result of:

- A. Blunt force impact, left temporal region
- B. Fall with impact to occiput
- C. Ruptured berry aneurysm
- D. Hypertension
- E. Gunshot wound of the right temporal region

Answer...

### **A. Blunt force impact, left temporal region (Correct answer, 73.1% responses)**

The decedent was struck several times in the head with a hammer, causing lacerations of the scalp and a fracture of the left temporal bone. The fracture can be seen extending through a branch of the middle meningeal artery (see additional photos).

The image depicts an epidural hematoma (EDH) in the left temporal region. EDH is a collection of blood between the inner table of the skull and the dura. The majority (90-95%) of epidural hematomas are located at the sides of the head (temporal area), are associated with skull fractures, and arise from tears in the middle meningeal artery. Roughly 10% of epidural hemorrhages are venous in nature due to an injury to a dural venous sinus.

These hematomas push the dura away from the inner table of the skull. The underlying cerebral hemisphere may exhibit “ruler straight” compression due to the EDH pushing on the thick fibrous dura, evenly distributing pressure over the surface of the brain. On imaging these hematomas appear biconvex or lens-shaped.

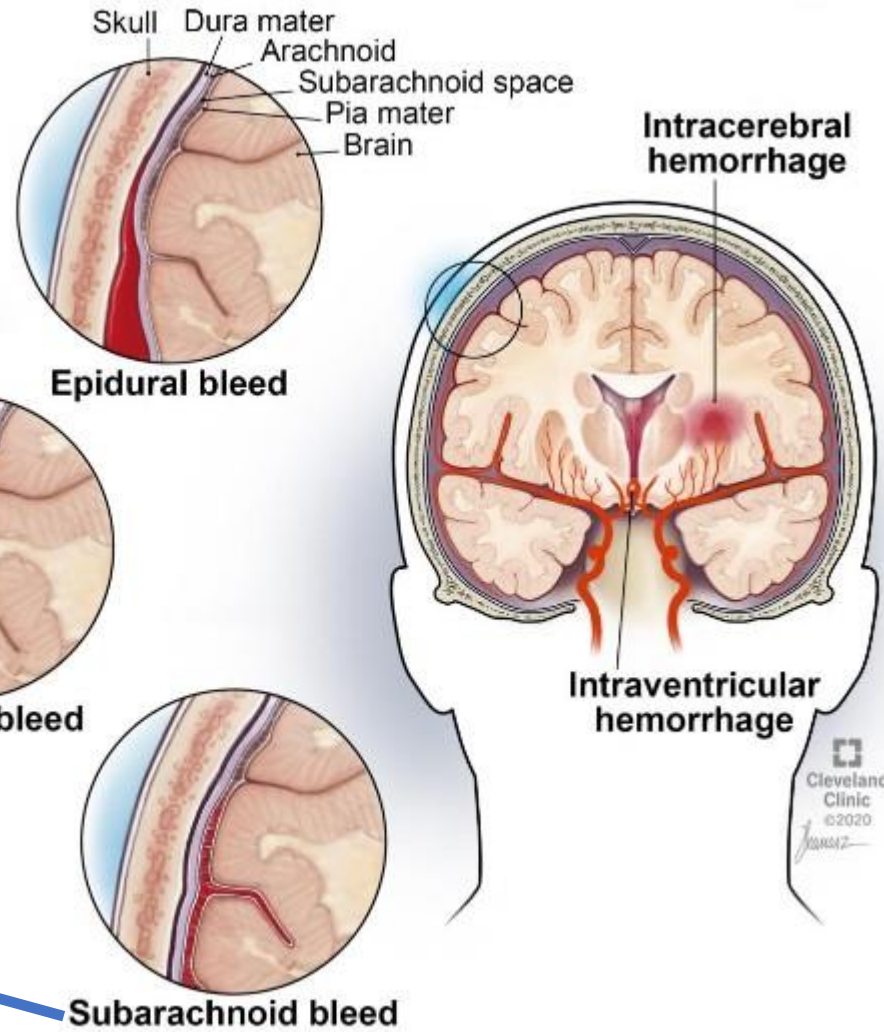
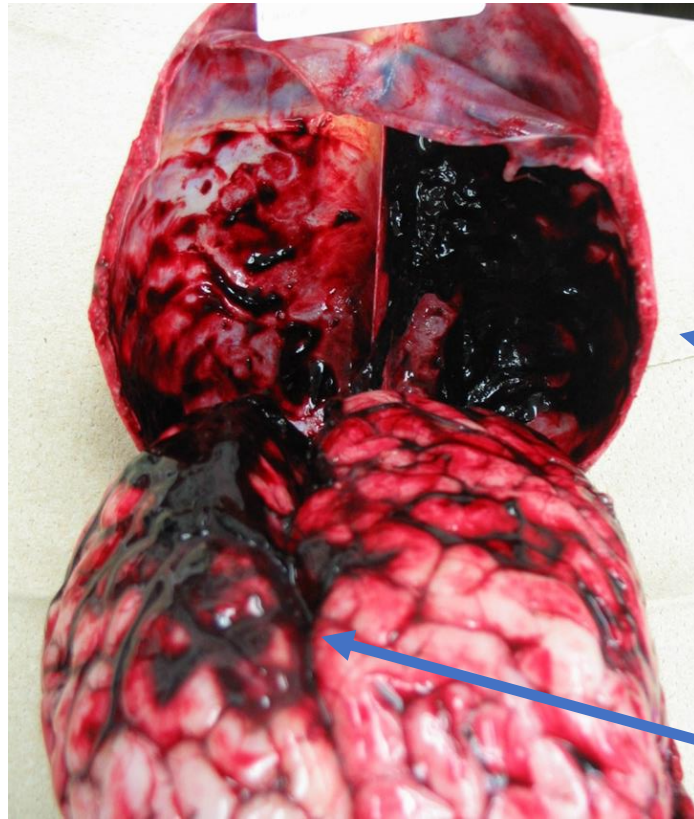
Clinical symptoms are varied and depend on how quickly the hematoma forms and how large it becomes. Classically, the injured person may experience a “lucid interval” following head injury during which the torn artery continues to bleed. Epidural hematomas may evolve rapidly or be delayed in their formation; up to several hours may pass before the hematoma is large enough to cause symptoms by mass effect. There is significant morbidity and mortality with rapid expansion such that even a small hematoma can create a life-threatening emergency. Epidural hematomas are generally regarded as neurosurgical emergencies.



Abraded lacerations consistent with hammer blows to the scalp.



Left temporal bone fracture.



<https://my.clevelandclinic.org/health/diseases/22034-epidural-hematoma>



Other responses:

### **B. Fall with impact to occiput (10.07% responses)**

Falls with impact to the occiput are more often associated with coup-countercoup contusions within the cerebral cortex and/or subdural hemorrhage (SDH) in vulnerable populations (young and elderly).

A subdural hematoma may occur with or without skull fracture and may also occur without impact injury (nontraumatic and spontaneous). Subdural hematomas are characterized by low-pressure venous bleeding, classically due to tearing of the bridging veins. Subdural hemorrhage tends to accumulate slower than EDH and may go unrecognized until later after trauma than an epidural hematoma (especially in the setting of trivial injury). The slow venous bleed eventually accumulates with an insidious and vague onset of symptoms. Fatal decompensation may be rapid as compression of the brain increases.

### **C. Ruptured berry aneurysm (7.62% responses)**

Berry aneurysms (also called saccular aneurysms) are characterized by ballooning of a weakened area within the wall of a cerebral blood vessel. These aneurysms occur in the major arteries at the base of the brain, most commonly in the anterior half of the Circle of Willis. A rupture in one of these aneurysms results in subarachnoid hemorrhage (hemorrhage located between the leptomeninges and the surface of the brain).

#### **D. Hypertension (3.69% responses)**

Intracranial hemorrhages associated with hypertension are most often intraparenchymal hemorrhages (commonly referred to as a “hemorrhagic stroke”). Classically, hypertensive disease causes intraparenchymal hemorrhage in areas supplied by penetrating branches of the middle cerebral and basilar arteries (supplying the putamen, pons, basal ganglia, and thalamus). Rupture of small blood vessels results in extravasating blood displacing, compressing, and disrupting adjacent brain tissue resulting in a cavitory defect. Rupture through parenchyma into the ventricular system is common. Though less common, rupture through the parenchyma into the subdural space may also occur. Hypertensive bleeds are usually symptomatic due to rapid expansion causing a sudden onset of stroke symptoms.

#### **E. Gunshot wound of the right temporal region (5.53% responses)**

While it is possible for there to be blood in the epidural space associated with a gunshot wound of the head, the most common cause of epidural hematoma is fracture of the temporal bone due to blunt force injury.

# References

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- Image: [clevelandclinic.org/health/diseases/22034-epidural-hematoma](https://clevelandclinic.org/health/diseases/22034-epidural-hematoma)