

S14-Medical Imaging Used to Diagnose and Treat Subdural Hematomas

Objectives

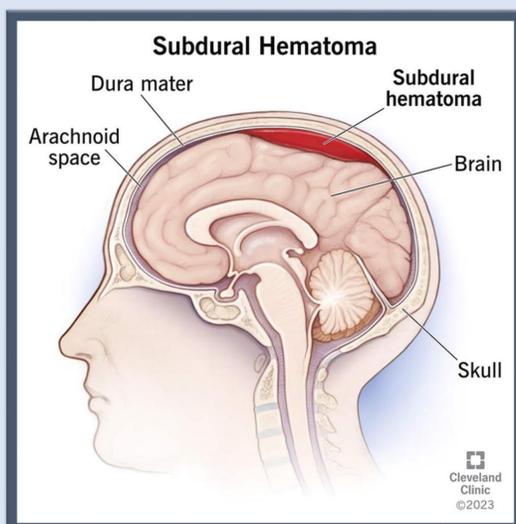
- Define and classify subdural hematomas.
- Identify what imaging modalities aid in the diagnosis of subdural hematomas and how they are treated.

Thesis Statement

Identify and define subdural hematomas and what imaging modalities are used to help diagnose and treat the injury.

Define Subdural Hematomas

- The Cleveland Clinic defines subdural hematomas as “ a type of bleeding near your brain that can happen after a head injury. It happens when blood collects under the dura mater, one of the layers of tissue that protect your brain.” (*Subdural Hematoma*, 2025, para. 5)
- A subdural hematoma is a type of traumatic brain injury (TBI).
- One of the deadliest of all head injuries.



The above image demonstrates what a subdural hematoma looks like in an axial plane. (2025) Hematoma [Photograph] Subdural Hematoma
<https://my.clevelandclinic.org/health/diseases/21183-subdural-hematoma>

Commons Symptoms

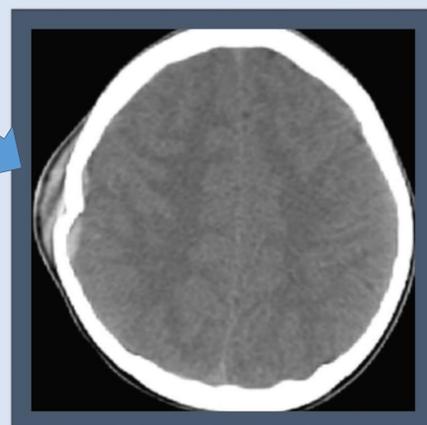
- Drowsiness, confusion, or coma
- Decreased memory
- Headache
- Seizures or loss of consciousness
- Nausea or vomiting
- Behavioral changes
- Weakness of arms, legs and face (*Subdural Hematoma*, n.d.)

Types of Subdural Hematomas

- Acute subdural hemorrhage - A quickly progressing brain bleed, usually brought on by a serious head injury such as a fall or automobile accident.
- Chronic subdural hemorrhage - A slow-growing hematoma that is commonly seen in elderly people or those with risk factors like alcoholism or blood thinners.
- (*Subdural Hemorrhage: Causes, Symptoms & Treatment*,n.d.)

What Imaging Modalities are Best for Diagnosing Subdural Hematomas

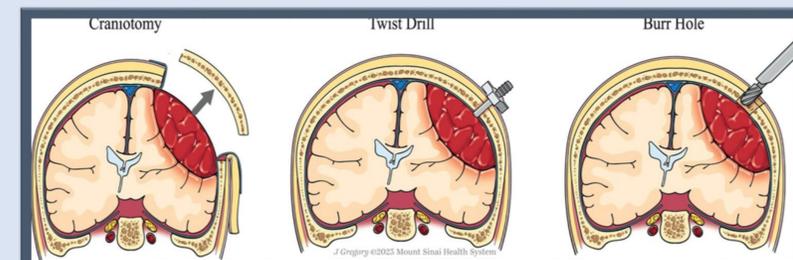
- CT: Due to its ability to accurately display acute hemorrhage and skull fractures, its relative speed, and its greater accessibility compared to MRI, CT scanning is typically the initial assessment for patients with suspected acute subdural hematomas. Wagner, M. (2024).
- MRI: In the non-acute context, MRI is the preferred scan due to its high sensitivity and specificity, as CT may miss smaller hemorrhages. MRI's multiplanar capabilities help identify tiny hematomas. Wagner, M. (2024).



The image on the left is an axial head computed tomography that reveals a tiny subdural hematoma next to a fractured skull. Wagner, A.L. (2024) Fig. 1 [Photograph] Subdural hematoma imaging
<https://emedicine.medscape.com/article/344482-overview?form=fpf>

Treatment

Immediate surgery may be required in some cases to reduce pressure on the brain by drilling a hole into the cranium to drain any blood
Large hematomas may need to be removed by a procedure called a craniotomy
Medications often administered include, anti-seizure, corticosteroids, and diuretics (*Subdural Hematoma*, n.d.)



The above image shows three different evacuation techniques used to surgically remove the blood collection that is compressing the brain tissue. The craniotomy is the most invasive of these techniques but also the most surgically effective at removing the blood clot. Figure 1. [Photograph] n.a.
<https://www.frontiersin.org/journals/neurology/articles/10.3389/fneur.2023.1086645/full>

Conclusion

- Utilizing different imaging modalities is crucial in diagnosing severe traumatic brain injuries such as subdural hematomas.
- Subdural hematomas are a type of bleeding near your brain that can occur after a head injury and causes blood to collect under the dura matter tissue.
- CT and MRI scans both have the ability to accurately display acute hemorrhages and skull fractures in a relative time frame for radiologist to identify so that treatment may be determined, such as surgery.