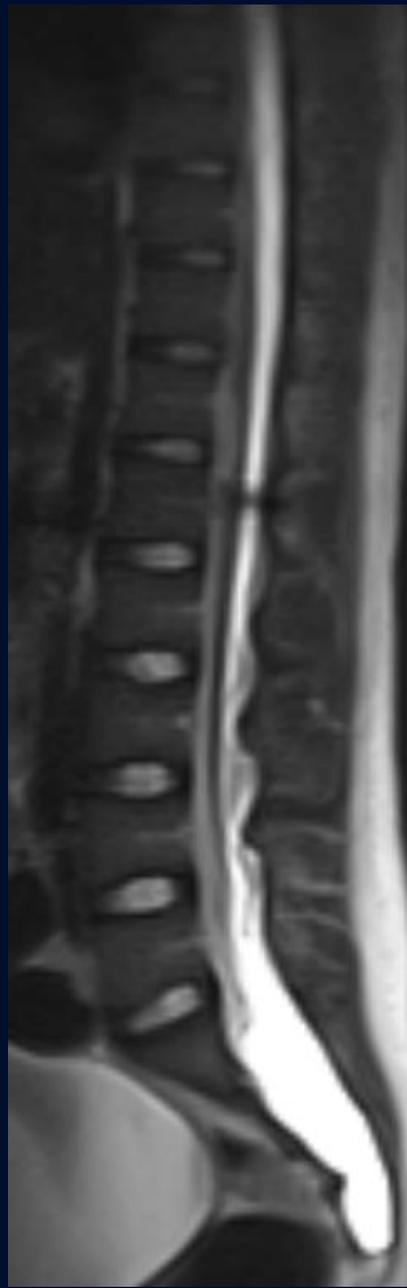


17-year-old male Presenting with Headache after a Fall Downstairs

Rebecca Kenney, MS₃

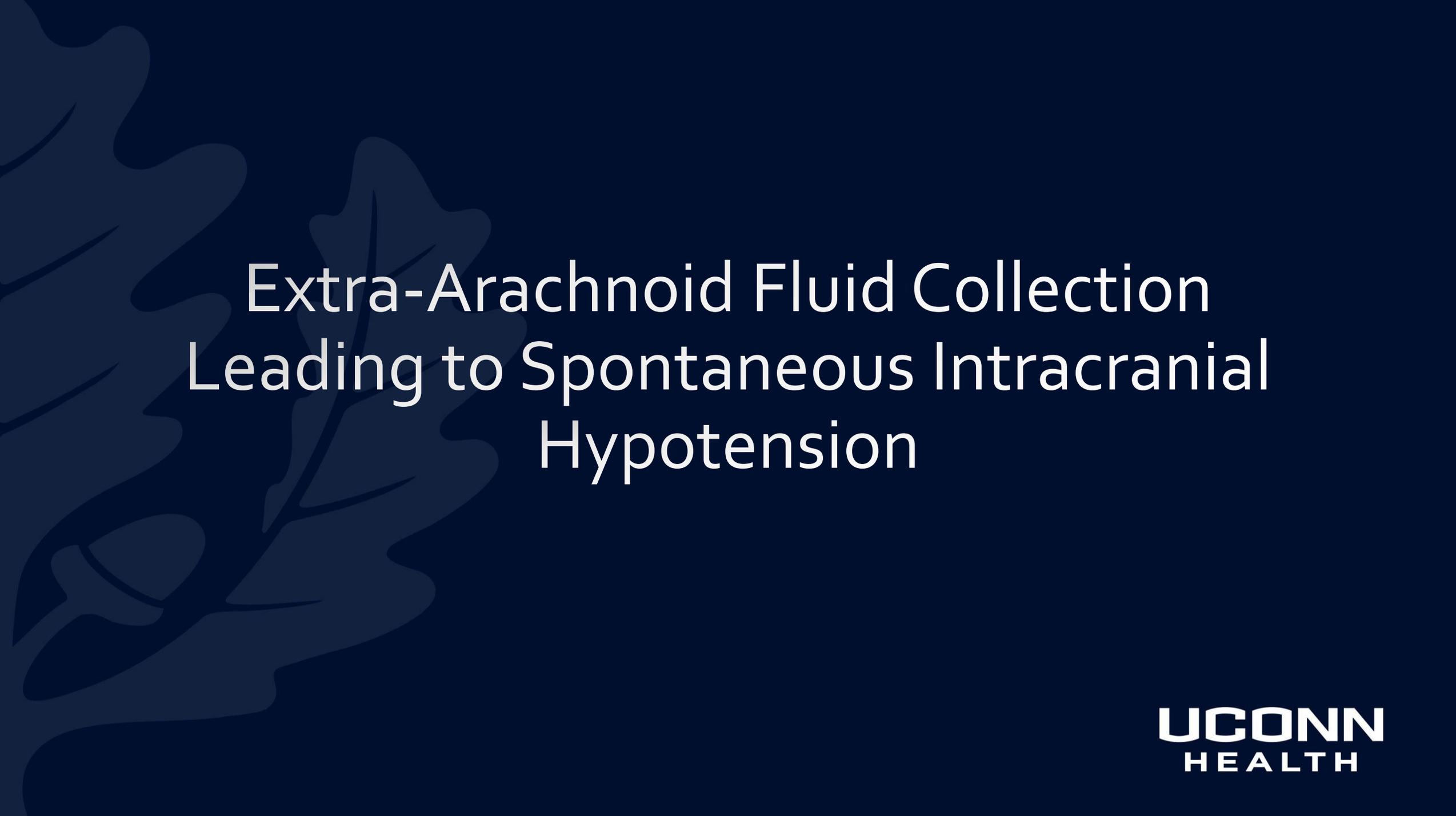
Edward Gillis, DO

Brad Kincaid, MD

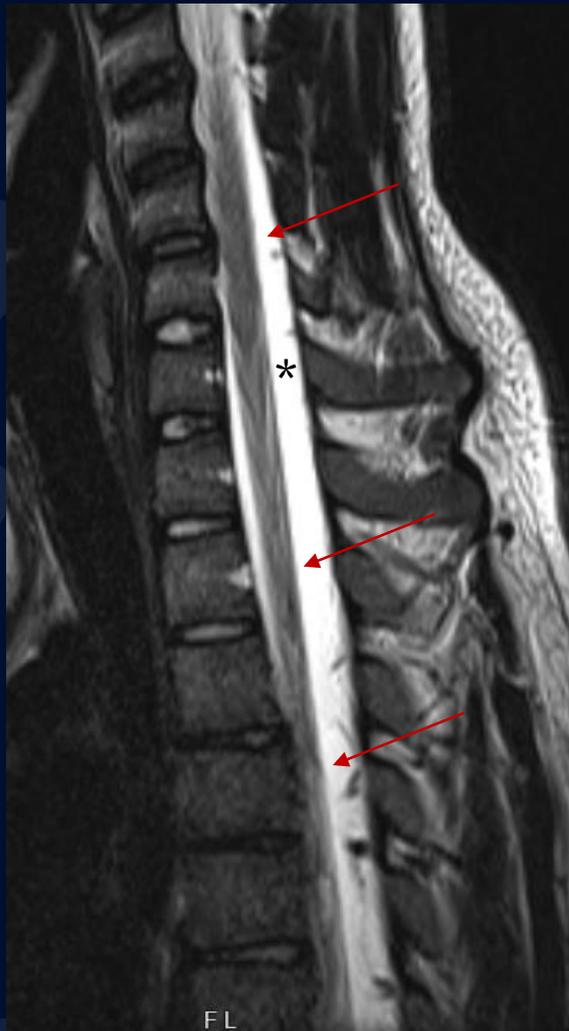




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The background features a dark blue, stylized leaf pattern on the left side, with the leaves extending towards the center. The rest of the background is a solid dark blue color.

Extra-Arachnoid Fluid Collection Leading to Spontaneous Intracranial Hypotension



Sagittal T2WI images of the spine showing a dorsal epidural fluid collection from C2 to L1 (asterisk), with mass effect on the cervical and thoracic cord (red arrows) without frank cord compression. Large intra-sacral meningocele is also seen (blue arrow)

Spontaneous Intracranial Hypotension

Epidemiology

- Estimated annual incidence is 5 per 100,00
- Peak incidence is around age 40, but children and older adults can be affected
- Women are affected more frequently than men with a ratio of 2:1

Etiology

- Spontaneous low CSF pressure due to spinal CSF leak
- The low CSF volume causes a headache that is worse in the upright position due to traction on the meningeal structures
- CSF leak may be due to rupture of an arachnoid membrane
- Rupture may be associated with an underlying connective tissue disorder
- A minor trauma like a fall, sneeze or sports activity may cause rupture of spinal epidural cysts (formed during fetal development) or perineural cysts, or may cause a tear in the dural sheath
- Degenerative disc disease and osseous spurs may also cause dural tears

Spontaneous Intracranial Hypotension

Presentation

- Headache with sudden or gradual onset usually upon sitting or standing
 - Often described as throbbing, or dull pain, can be generalized or focal
 - Headache is relieved with lying down
 - The headache is usually not improved with pain medications
- Associated symptoms: neck pain/stiffness, nausea, vomiting, vertigo, dizziness, blurred vision and photophobia

Diagnosis

- Criteria
 - Headache in temporal relation to low CSF pressure or CSF leakage
 - CSF pressure <60 mmH₂O or evidence of CSF leakage on imaging

Spontaneous Intracranial Hypotension

Diagnosis

- Imaging: brain and spine MRI
 - Brain MRI: Acronym for features of spontaneous intracranial hypotension on brain MRI is SEEPS (Subdural fluid collections, Enhancement of the dura mater, Engorgement of the venous structures, Pituitary enlargement, and Sagging of the brain)
 - Spine MRI: extra-arachnoid fluid collections, collapse of the dural sac, engorgement of epidural venous plexus, meningeal diverticula, extradural extravasation of fluid
- Differential: over-drainage from CSF shunt, postural tachycardia syndrome, meningitis, tumor, subarachnoid hemorrhage

Spontaneous Intracranial Hypotension

Treatment

- If headache is mild to moderate severity: Conservative treatment of avoiding upright position, strict bed rest, analgesics, hydration, high oral caffeine intake and high salt intake
- Epidural blood patch for patients who fulfill any of the following conditions:
 - Acute, mild to moderate headache unresponsive to a reasonable period of conservative treatment (one to two weeks)
 - Severe headache or other disabling symptoms regardless of duration
 - Symptomatic for two weeks or longer at time of diagnosis
 - An aggressive precipitating injury as compared with a minor trauma
 - History of connective tissue disease or joint hypermobility

References

1. Sun-Edelstein, C. and Lay, C. Spontaneous intracranial hypotension: Pathophysiology, clinical features, and diagnosis. *UpToDate*. 2018.
2. Kenney, R., Gillis E., Kincaid, B. Extra-Arachnoid Fluid Collection Resulting in Spontaneous Intracranial Hypotension. *Radiology Online* 2019.