10 Myths and Misconceptions about Spontaneous Intracranial Hypotension

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Disclosures

1. No conflict of interest

2. Use of fibrin glue for epidural injection is off label
1. SIH defined by low pressure
2. SIH always characterized by orthostatic HA/orthostatic HA is always SIH
3. Negative brain MRI excludes SIH
4. Patients w/dural enhancement need workup for infectious meningitis first
5. Chiari I is a feature of SIH
6. All leaks are caused by spinal diverticula/Tarlov cysts
7. Spinal Imaging rarely reveals the leak
8. Skull base CSF leaks cause SIH
9. Blood patch immediately cures SIH
10. After the blood patch, the job is done
Myth #1: SIH is defined by low pressure

Case example:

- 57 y.o. female with positional headache
- Opening pressure: 25.4 cm H20
Myth #1: SIH is defined by low pressure

Case example:

- 57 y.o. female with headache
- Opening pressure: 25.4 cm H₂O
**Myth #1:** SIH is defined by low pressure

Traditionally defined by pressure <6 cm H2O

- **Most patients actually in normal range**
- **Higher pressure the longer you leak**
- **Higher pressure the larger the patient is**

Myth #2: SIH always causes orthostatic HA/orthostatic HA is always SIH

Most cases (~75%) of SIH have orthostatic HA

But...

- 2\textsuperscript{nd} half-of-the-day HA
- Non-positional HA
- Acephalgic

Mimics:

- POTS
- Cervicogenic HA
- New Daily Persistent Headache (NDPH)
- Some hard to classify
Myth #2: SIH always causes orthostatic HA/orthostatic HA is always SIH

56 yo woman with ear pain and tinnitus, no headache
Myth #3: A negative brain MRI excludes the diagnosis

55 yo woman with positional headache
Myth #3: A negative brain MRI excludes the diagnosis

Prevalence:
- Dural Enhancement: 83%
- Brain Sagging: 61%
- Venous Distension: 75%

Relationship to pressure:

Myth #4: When dural enhancement is seen on MRI, r/o infection first

- Infectious meningitis is leptomeningitis, not pachymeningitis
- Nothing else besides SIH typically causes diffuse, smooth dural enhancement
Myth #5: Chiari I is a feature of SIH

Normal

Brain sag
Myth #5: Chiari I is a feature of SIH
Myth #5: Chiari I is a feature of SIH

Called “Chiari”

Suboccipital decompression

Post-op

Case courtesy of Mike Hazenfield, M.D.
Myth #6: All leaks caused by diverticula/Tarlov Cysts

3 Major Causes

- Leaking diverticulum
- Calcified thoracic disk
- CSF-Venous fistula

**Leaking sacral Tarlov cysts are very rare**
Myth #7: Spinal imaging rarely reveals the leak

About 50% of cases of bona fide SIH have a leak on CTM

But...

They can be subtle!
Myth #7: Spinal imaging rarely reveals the leak

Good technique (i.e. thin images, breath hold, reformats) is key!
Myth #8: Skull base CSF leaks cause SIH

Above this point, CSF pressure is negative relative to atmosphere.

FIG. 1. Drawing shows that the distance between ZPS and HIP corresponds to the CSF pressure in the lateral position (mm H2O).
ZPS = Level of zero CSF pressure while in the sitting position. HIP = Hydrostatic indifferent point for lateral and sitting positions.
Lack of causal association between spontaneous intracranial hypotension and cranial cerebrospinal fluid leaks

Clinical article

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Object. Spontaneous intracranial hypotension is an important cause of headaches and an underlying spinal CSF leak can be demonstrated in most patients. Whether CSF leaks at the level of the skull base can cause spontaneous intracranial hypotension remains a matter of controversy. The authors’ aim was to examine the frequency of skull base CSF leaks as the cause of spontaneous intracranial hypotension.

Methods. Demographic, clinical, and radiological data were collected from a consecutive group of patients evaluated for spontaneous intracranial hypotension during a 9-year period.

Results. Among 273 patients who met the diagnostic criteria for spontaneous intracranial hypotension and 42 who did not, not a single instance of CSF leak at the skull base was encountered. Clear nasal drainage was reported by 41 patients, but a diagnosis of CSF rhinorrhea could not be established. Four patients underwent exploratory surgery for presumed CSF rhinorrhea. In addition, the authors reviewed 3 patients who had a postoperative CSF leak at the skull base following the resection of a cerebellar pontine angle tumor and developed orthostatic headaches; spinal imaging, however, demonstrated the presence of a spinal source of CSF leakage in all 3 patients.

Conclusions. There is no evidence for an association between spontaneous intracranial hypotension and CSF leaks at the level of the skull base. Moreover, the authors’ study suggests that a spinal source for CSF leakage should even be suspected in patients with orthostatic headaches who have a documented skull base CSF leak.

Conclusions. There is no evidence for an association between spontaneous intracranial hypotension and CSF leaks at the level of the skull base. Moreover, the authors’ study suggests that a spinal source for CSF leakage should even be suspected in patients with orthostatic headaches who have a documented skull base CSF leak.
Myth #9: Blood patch immediately cures SIH

Unlike post-LP headache
Can take up to a week
Myth #10: After the blood patch, the job is done

**SIH**
- Low volume, low pressure
- Worse when upright
- Often occipital

**RIH**
- High(er) pressure
- Worse when recumbent (night)
- Often frontal
- Nausea common
- Onset after blood patch (worst in 1st 24 hrs)
Myth #10: After the blood patch, the job is done

RIH: Treatment

**Mild**
- Elevate head
- Analgesia

**Moderate**
- + Acetazolamide, methazolamide oral
- + Topirimate, other diuretics oral

**Severe**
- +/- immediate acetazolamide IV LP to remove fluid
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