

# Localization and Treatment of Spontaneous CSF Leaks Without Conclusive Imaging

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## Introduction:

- Primary spontaneous CSF leaks are rare but can lead to significant morbidity, including meningitis.
- Spontaneous CSF leaks are often associated with idiopathic intracranial hypertension (IIH).
- A source of CSF leak is not identified on imaging in a small subset of these cases.
- High resolution CT (HRCT) scans provide excellent bony detail, but it can be difficult to differentiate sinus secretions or opacification from leaked CSF.
- MRI with CISS protocol provides better differentiation of CSF leaks, encephaloceles, and meningoceles.
- The purpose of this study is to identify the most common anatomic subsites of primary spontaneous CSF leaks not clearly identified by high-resolution CT and to detail the management and outcomes of these cases

## Methods:

- Retrospective chart review of adult patients treated for primary spontaneous CSF leaks with inconclusive imaging from 2012-2022
- Demographic data, presenting symptoms, imaging results, and treatment plans were recorded
- Descriptive statistical analysis was performed to identify the most common anatomic subsites

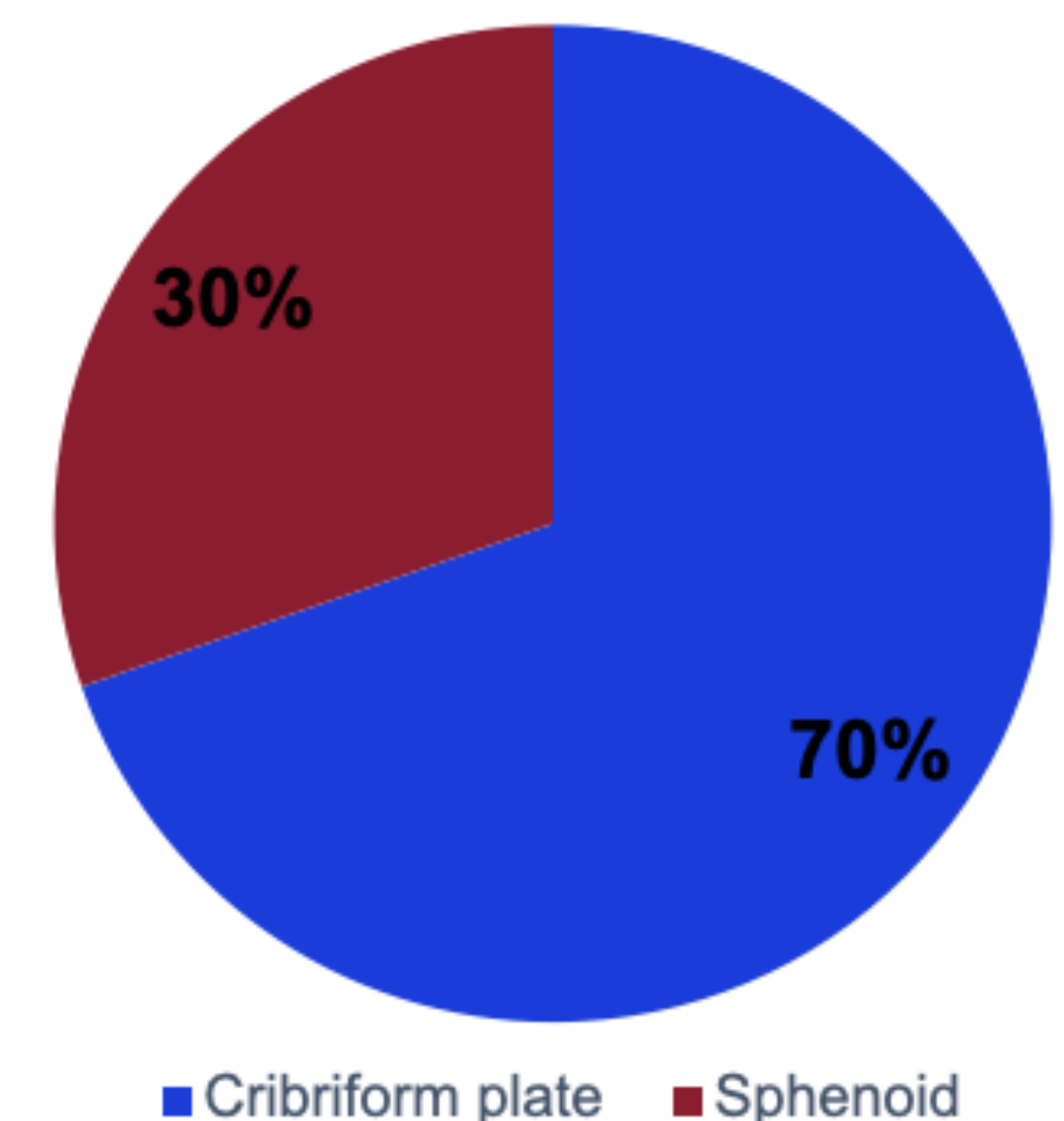
## Results:

- HRCT was unable to identify a source in 33 of 596 patients diagnosed with anterior skull base CSF leaks
- MRI with constructive interference in steady state (CISS) protocol was obtained in 81.8% and identified a source in 7 cases where HRCT was negative
- Imaging demonstrated empty sella syndrome in 63.2%
- 79.3% diagnosed with idiopathic intracranial hypertension (IIH) by lumbar puncture with opening pressure >25 cmH<sub>2</sub>O (mean 32.2)
- Intraoperative intrathecal fluorescein was used in 34.6% of leaks not identified on either CT or MRI with successful identification of the source
- CSF-diverting shunts were placed in 54.5%
- Acetazolamide was started in 51.5%
- 3 patients developed recurrent CSF leaks within 2 years, all of whom did not have an opening pressure measured or shunt placed during their initial hospitalization
- Mean length of stay with a shunt was 2.4 days (Range: 1-4 days) and without a shunt was 6.8 days (Range: 3-13 days)

Presenting symptoms	%
Clear nasal drainage	97.0
Headache	51.5
Salty/Metallic Taste	30.3
Δ Vision	21.2
Photophobia	6.1
Δ Hearing	6.1
Meningitis	3.0
Nausea	3.0

Table 1: Most common presenting symptoms

Figure 1: Location of Spontaneous CSF Leaks



## Conclusion

- MRI and CT are complementary imaging modalities.
- MRI with CISS protocol may help identify the source of CSF leaks missed on HRCT
- The most common site of primary spontaneous CSF leaks was at the cribriform plate followed by the sphenoid sinus
- Intrathecal fluorescein is a useful intraoperative tool when imaging is inconclusive
- Failure to properly manage increased intracranial pressure can lead to recurrence

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