Cerebrospinal fluid fistula diagnosis

- Successful endovascular treatment of a spontaneous dorsal cerebrospinal fluid venous fistula: A case report
- Effectiveness of the middle turbinate flap for the treatment of spontaneous fistulas
- CSF-venous fistulae-An underrecognized cause of superficial siderosis
- Spontaneous Salivary Fistula Masquerading as CSF Otorrhea
- Spontaneous Intracranial Hypotension in Professional Dancers: A Case Report and Rehabilitation Strategy
- Reversal of Coma With Trendelenburg Position in Spontaneous Intracranial Hypotension
- Photon-Counting CT Myelography for the Detection of Spinal CSF Leaks
- Revisiting a Rare Anomaly Described 25 Years Ago in the AJNR: A Journey from Pediatric Hemifacial Microsomia and Middle Cranial Fossa Aplasia to CSF-Lymphatic Fistula and Spontaneous Intracranial Hypotension as an Adult

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Beta-2 transferrin, is almost exclusively found in the cerebrospinal fluid. It is not found in blood, mucus or tears, thus making it a specific marker of cerebrospinal fluid, applied as an assay in cases where cerebrospinal fluid fistula is suspected.

Diagnosis of cerebral spinal fluid (CSF) leaks traditionally involves laboratory testing of markers and appropriate imaging. Surgical localization can be difficult, and the inability to accurately localize skull base defects leads to increased rates of repair failure and complications. Many imaging techniques localizing and identifying CSF leaks have been proposed. Comparisons of current and investigational imaging techniques used to localize CSF leaks are reviewed.

A comprehensive and systematic search through PubMed, Scopus, and reference lists from relevant articles was completed to identify literature on sensitivities of different imaging methods for localization and detection of CSF leaks. Prospective, retrospective, and case series published since 1995 that addressed imaging techniques for CSF leaks confined to the skull base were included. Sensitivities of each major imaging technique proposed were recorded and analyzed.

133 studies were initially screened from 2,125 studies on preliminary search. Of these, 38 studies were included based on inclusion criteria. Studies were segregated by imaging modality. A total of 1,000 patients with CSF leaks were subsequently evaluated.

While radionuclide cisternography has been the historical standard, recent imaging techniques have emerged considering the low sensitivity. Computed tomography cisternography (CTC) with contrast also has low sensitivity, even in active leaks. While high-resolution CT is commonly the initial study of choice, MRI methods, particularly 3D imaging, may prove to be a more sensitive study of choice. CT/MRI combination methods may show promise in localizing CSF leaks. Stratifying by status and etiology may be an important determinant. Further studies investigating various imaging techniques for localizing CSF leaks are needed [1)].

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(111)In-DTPA RIC images were taken at 0, 1, 3, 6, and 24-h after radioisotope injection following the current protocol. Regions of interest (ROI) were selected on 3-h images to include brain, spine, bladder or the whole body. The accumulative radioactivity counts were calculated for quantitative analysis. Final diagnoses of SCH were established based on the diagnostic criteria recently proposed by Schievink and colleagues.

Thirty-five patients were focused on. Twenty-one (60.0%) patients were diagnosed as having SCH according to the Schievink criteria. On the 3-h images, direct cerebrospinal fluid leakage sign was detected in nine of 21 SCH patients (42.9%), as well as three patients with suspected iatrogenic leakage. Compared to non-SCH patients, SCH patients showed higher bladder accumulation at 3-h images ($P = 0.0002$), and higher brain clearance between the 6- and 24-h images ($P < 0.0001$). In particular, the 24-h brain clearance was more conclusive for the diagnosis than 24-h whole cistern clearance. The combination of direct sign and 24-h brain accumulation resulted in 100% of accuracy in the 32 patients in whom iatrogenic leakage was not observed. 1- and 6-h images did not provide any additional information in any patients.

A new simple ROI setting method, in which only the 3-h whole body and 24-h brain images were necessary, was sufficient to diagnose SCH [2].

Fat-saturated 3D-T1W-SPACE

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1)
Eljazzar R, Loewenstern J, Dai JB, Shrivastava RK, Iloreta AM Jr. Detection of CSF Leaks: Is There a Radiologic Standard of Care? A Systematic Review Detection of CSF Leaks: A Systematic Review. World Neurosurg. 2019 Feb 21. pii: S1878-8750(19)30434-6. doi: 10.1016/j.wneu.2019.01.299. [Epub ahead of print] Review. PubMed PMID: 30797912.

2)
Hoshino H, Higuchi T, Achmad A, Taketomi-Takahashi A, Fujimaki H, Tsushima Y. A new approach for simple radioisotope cisternography examination in cerebrospinal fluid leakage detection. Ann Nucl Med. 2016 Jan;30(1):40-8. PubMed PMID: 26466604.