



Get Clarity On Generics

Cost-Effective CT & MRI Contrast Agents

 FRESENIUS
KABI

[WATCH VIDEO](#)

AJNR

This information is current as
of August 1, 2025.

Photon-Counting CT Myelography for the Detection of Spinal CSF Leaks

Ajay A. Madhavan, Peter G. Kranz, Waleed Brinjikji, Ian T. Mark and Timothy J. Amrhein

AJNR Am J Neuroradiol 2025, 46 (4) 846

doi: <https://doi.org/10.3174/ajnr.A8736>

<http://www.ajnr.org/content/46/4/846>

Photon-Counting CT Myelography for the Detection of Spinal CSF Leaks

Ajay A. Madhavan, Peter G. Kranz, Waleed Brinjikji, Ian T. Mark, and Timothy J. Amrhein

ABSTRACT

Photon-counting CT myelography is a relatively recently described technique for the detection of spinal CSF leaks in patients with spontaneous intracranial hypotension.¹⁻³ In this Video, we outline the fundamental procedural techniques used in CT myelography for CSF leak detection, as well as specific advantages and reconstruction options available when using photon-counting CT.⁴⁻⁷ Additionally, we show examples demonstrating the typical appearance of common spinal CSF leaks detected on photon-counting CT myelography, which mainly include dural tears and CSF-venous fistulas.⁸ This Video draws on technical insights gleaned from a multi-institutional perspective, while specific techniques continue to vary at different centers. Future refinement of photon-counting CT myelographic techniques at multiple centers will be helpful to maximally leverage this nascent technology.

Disclosure forms provided by the authors are available with the full text and PDF of this article at www.ajnr.org.

REFERENCES

1. Madhavan AA, Yu L, Brinjikji W, et al. Utility of photon-counting detector CT myelography for the detection of CSF-venous fistulas. *AJNR Am J Neuroradiol* 2023;44:740-44 [CrossRef Medline](#)
2. Schwartz FR, Kranz PG, Malinzak MD, et al. Myelography using energy-integrating detector CT versus photon-counting detector CT for detection of CSF-venous fistulas in patients with spontaneous intracranial hypotension. *AJR Am J Roentgenol* 2024;222:e2330673 [CrossRef Medline](#)
3. Schwartz FR, Malinzak MD, Amrhein TJ. Photon-counting computed tomography scan of a cerebrospinal fluid venous fistula. *JAMA Neurol* 2022;79:628-29 [CrossRef Medline](#)
4. Madhavan AA, Cutsforth-Gregory JK, Brinjikji W, et al. Application of a denoising high-resolution deep convolutional neural network to improve conspicuity of CSF-venous fistulas on photon-counting CT myelography. *AJNR Am J Neuroradiol* 2023;45:96-99 [CrossRef Medline](#)
5. Mamlouk MD, Ochi RP, Jun P, et al. Decubitus CT myelography for CSF-venous fistulas: a procedural approach. *AJNR Am J Neuroradiol* 2021;42:32-36 [CrossRef Medline](#)
6. Carlton Jones L, Goadsby PJ. Same-day bilateral decubitus CT myelography for detecting CSF-venous fistulas in spontaneous intracranial hypotension. *AJNR Am J Neuroradiol* 2022;43:645-48 [CrossRef Medline](#)
7. Callen AL, Timpone VM, Schwertner A, et al. Algorithmic multimodality approach to diagnosis and treatment of spinal CSF leak and venous fistula in patients with spontaneous intracranial hypotension. *AJR Am J Roentgenol* 2022;219:292-301 [CrossRef Medline](#)
8. Madhavan AA, Cutsforth-Gregory JK, Brinjikji W, et al. Benefits of photon-counting CT myelography for localization of dural tears in spontaneous intracranial hypotension. *AJNR Am J Neuroradiol* 2024;45:668-71 [CrossRef Medline](#)

Received January 10, 2025; accepted after revision February 19.

From the Division of Neuroradiology (A.A.M., W.B., I.T.M.), Department of Radiology, Mayo Clinic, Rochester, Minnesota; and Division of Neuroradiology (P.G.K., T.J.A.), Department of Radiology, Duke Health, Durham, North Carolina.

Please address correspondence to Ajay Madhavan, MD, Division of Neuroradiology, Department of Radiology, Mayo Clinic, 200 First St SW, Rochester, MN 55905; e-mail: madhavan.ajay@mayo.edu

<http://dx.doi.org/10.3174/ajnr.A8736>