Myelographic Timing Matters

We read with great interest the article by Huls et al[1] titled, "Utility of Dual-Energy CT to Improve Diagnosis of CSF Leaks on CT Myelography following Lateral Decubitus Digital Subtraction Myelography with Negative Findings." The authors report that dual-energy CT myelography (CTM) aided in the detection of subtle CSF leaks after normal findings on decubitus digital subtraction myelography (DSM) and suggested that dual-energy CTM may serve as another diagnostic tool in certain patients with CSF leaks that are difficult to detect.

While further use of dual-energy CT may indeed show some additional benefit in the diagnosis of a spinal CSF leak, the timing of the myelographic examination with respect to the injection of contrast is important in CSF leak detection and was not well-addressed in the article. For CSF-venous fistulas, prompt imaging after the contrast injection is paramount; delayed imaging is not helpful.[2] In our experience using decubitus CTM, delayed scanning even a few minutes after the contrast injection can fail to show the CSF-venous fistula.[3] The authors describe how dual-energy CTM was performed after the DSM examination; there is undoubtedly more than a few minutes between examinations, and we suspect that this lapsed time is an important limitation of the examination. None of the CSF-venous fistulas shown in the examples demonstrate a full venous course, just small foci of enhancement. In addition, it is difficult to confidently distinguish which type of spinal CSF leak (dural tear, ruptured meningeal diverticulum, or CSF-venous fistula) is shown in these images. If this dual-energy CTM were performed in a dedicated fashion immediately after the contrast injection instead of the DSM, perhaps the findings would have been more conspicuous and would have more definitively guided treatment. We recognize that the authors primarily relied on DSM for CSF-venous fistula evaluation and that this post-DSM CTM serves as an adjunctive tool.

The authors' study also raises a larger question of the sensitivity and specificity of CSF leak detection between decubitus CTM and decubitus DSM, particularly for CSF-venous fistula evaluation. We recognize that this issue was not the intent of the study, but it does generate discussion. To date, there are no direct comparisons between the 2 techniques, and most centers perform one or the other, depending on operator preference and equipment availability.[2] While performing a study comparing the 2 techniques would be cumbersome and result in excess radiation to patients undergoing up to 4 myelographic examinations (2 CTMs and 2 DSMs to image both sides of spine well), the results could potentially lead to a paradigm shift in the spinal CSF leak evaluation. In the absence of a study and in a patient with a high suspicion for CSF-venous fistula and negative findings on decubitus DSM or CTM, it may be beneficial to try the other technique to improve detection. This complementary role of dedicated decubitus DSM and CTM examinations may help in patients with elusive spinal CSF leaks.

In summary, the timing of the myelographic examination with respect to the contrast injection plays a key role in the detection of spinal CSF leaks. Further studies are needed to compare CTM, DSM, and the adjunctive role of dual energy.

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

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