

# The good and bad of MRI evaluation of the urothelial tract

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When performed properly, MR urography (MRU) can be an alternative to CT urography (CTU) for imaging of the entire urinary tract. Some radiologists may prefer MRU for pediatric populations, patients undergoing repeat examinations, and individuals with compromised renal functions.

However, MRU can be a challenging examination to perform and interpret; therefore, a team of researchers published a study outlining the pitfalls along with potential methods of correcting, detecting, or avoiding them. The information is discussed in the study, "MRI Evaluation of the Urothelial Tract: Pitfalls and Solutions," published in the December 2016 issue of the *American Journal of Roentgenology (AJR)*.

"Meticulous attention to detail is required to optimize the imaging quality of MRU, and in our experience, this can be more problematic to achieve with MRU than with CTU," said study coauthor Nicola Schieda, a radiologist with the Department of Medical Imaging, The Ottawa Hospital, Ontario. "When using the MRU examination, steps must be taken to ensure adequate distention of the collecting system and dilution of excreted gadolinium. It is important to recognize normal physiologic characteristics and expected findings on various pulse sequences, especially to avoid misinterpretation of strictures related to urinary peristalsis, filling defects related to flow-related artifacts, gadolinium mimicking urothelial hemorrhage, or hemorrhage mimicking tumor. Adequate visualization and evaluation of the entire urinary tract is critical because urothelial carcinoma frequently presents with

synchronous or metachronous lesions."

Common indications for MRU include, but are not limited to, investigation of the cause of urinary obstruction, evaluation of urothelial neoplasms, and characterization of complex congenital anomalies of the urinary system.

A potential advantage of using MRU rather than CTU is related to the role of MRI in quantitative tumor characterization, the study said. In particular, apparent diffusion coefficient values obtained from diffused weighted imaging may help prospectively predict tumor invasive or proliferative potential, which may affect management decisions.

The study was based on the authors' experience with MR Urography and an extensive review of the literature on the topic.

**More information:** Andrew D. Chung et al. MRI Evaluation of the Urothelial Tract: Pitfalls and Solutions, *American Journal of Roentgenology* (2016). [DOI: 10.2214/AJR.16.16348](https://doi.org/10.2214/AJR.16.16348)

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