Computed Tomography and Magnetic Resonance Small Bowel Enterography

Current Status and Future Trends Focusing on Crohn Disease

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KEYWORDS

• CT enterography • MR enterography • Small bowel imaging • Crohn disease • Update

KEY POINTS

- The Society of Abdominal Radiology (SAR) has recently developed, in collaboration with the American Gastroenterological Association (AGA), recommendations for evaluation and interpretation of computed tomography enterography (CTE) and magnetic resonance enterography (MRE) in patients with Crohn disease (CD) to help achieve more standardized practice.
- CTE and MRE are useful for monitoring disease-modifying therapy for CD, and we are in the early stages of using CTE and MRE results as endpoints to assess therapeutic outcomes in managing CD patients.
- Radiation dose-reduction techniques for CTE and DWI for MRE are currently well adopted in routine practice, whereas bowel motility and magnetization transfer MR imaging are under further exploration regarding feasibility for clinical use.

Video content accompanies this article at http://www.gastro.theclinics.com/.

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Abbreviations

ADC	Apparent diffusion coefficient
AGA	American Gastroenterological Association
CD	Crohn disease
CI	Confidence interval
CT	Computed tomography
CTE	Computed tomography enterography
DWI	Diffusion-weighted imaging
MaRIA	Magnetic resonance index of activity
MR	Magnetic resonance
MRE	Magnetic resonance enterography
MRI	Magnetic resonance imaging
ROI	Region of interest
SAR	Society of Abdominal Radiology
TNF	Tumor necrosis factor

INTRODUCTION

Computed tomography enterography (CTE) and magnetic resonance enterography (MRE) are state-of-the-art radiologic tests used to examine the small bowel. These examinations are distinguished from routine abdominopelvic computed tomography (CT) and magnetic resonance imaging (MRI) by the oral administration of a large amount of neutral fluid contrast before scanning to distend the bowel. CTE and MRE are not indicated for every case of suspected small bowel disease. Common clinical settings that require radiologic examination of the small bowel and the preferred techniques are summarized in **Table 1**. Hemodynamically stable suspected small bowel bleeding and Crohn disease (CD) are the most important indications for CTE and MRE.[1–4] Of these, this article focuses on the use of CTE and MRE for the evaluation of CD. Radiologic assessment of gastrointestinal bleeding is addressed elsewhere in this issue. General reviews regarding the techniques, imaging findings, and utility of CTE and MRE in CD are avoided, because there is now an abundance of excellent review articles on these topics. We explain recent efforts to achieve more standardized interpretation of CTE and MRE for improved care of patients with CD, summarize recent research studies that have investigated the role and impact of CTE and MRE more directly for several specific clinical and research issues beyond general diagnostic accuracy, and provide an update on progress in imaging techniques. We discuss these topics along with some highlights of the areas that need to be further explored in the future.

EFFORTS TO STANDARDIZE INTERPRETATION AND REPORTING OF COMPUTED TOMOGRAPHY ENTEROGRAPHY AND MAGNETIC RESONANCE ENTEROGRAPHY IN CROHN DISEASE

CTE and MRE are widely used in the management of CD and are highly accurate for diagnosing bowel inflammation and complications in CD. However, it seems that there is still substantial heterogeneity and inconsistency in how the examinations are interpreted and reported, between different readers within the same institution and across different institutions. Also, standardized criteria for imaging diagnosis of CD are lacking, as are recommendations for the use of these examinations by medical societies. Both quality and consistency in the interpretation and reporting of imaging examinations are crucial for advancing patient care especially for the management of chronic diseases, such as CD. Standardization of the items that should be evaluated on imaging and the nomenclature for describing the imaging findings can help enhance quality and consistency in the communication of CTE and MRE results among different