



# Achieving high-quality magnetic resonance enterography is critical for assessing Crohn's disease activity

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Magnetic resonance enterography (MRE) is recognized as a valuable tool for diagnosing and managing Crohn's disease.<sup>1</sup> MRE's utility spans assessing the extent and severity of inflammation, identifying complications, and monitoring the response to treatment in Crohn's disease. In terms of assessing disease activity, several MR indices have been developed and validated.<sup>2-4</sup> While the clinical usefulness of MRE is undeniable in Crohn's disease, it is essential to not lose sight of a pivotal factor: the achievement of high-quality images.

Bohra et al.<sup>5</sup> investigated how the quality of MRE images affects the assessment of disease activity in Crohn's disease, utilizing specific MRE activity indices. In their study, the quality of MRE was evaluated based on bowel distension and motion artifact. Imaging the small intestine presents unique challenges compared to other solid organs due to its typically collapsed state and normal peristaltic activity. These specific characteristics of the small intestine directly influence the image quality parameters used in Bohra et al.'s study.

Pathological conditions like inflammation can lead to an increased bowel wall thickness, a key factor in MR indices for assessing Crohn's disease activity. However, the accuracy of measuring bowel wall thickness can be compromised by inadequate bowel distension, as a collapsed bowel can appear

thicker. Thus, achieving optimal bowel distension is essential for a precise evaluation of bowel wall thickness. This necessitates choosing the right oral contrast agent and fine-tuning the dosage and administration method. MRE involves ingesting a contrast agent orally, often resulting in insufficient distension of the proximal jejunum. Bohra et al.'s findings echoed this issue. Although magnetic resonance enteroclysis can more reliably distend the intestines than MRE, its requirement for additional intubation can cause patient discomfort. Since Crohn's disease more commonly affects the ileum than the jejunum, MRE remains the preferred method for most cases of Crohn's disease.

The irregular peristaltic movement of the small intestine can significantly degrade image quality, a concern for MRE given the lengthy image acquisition time. Antiperistaltic agents like glucagon and hyoscine butylbromide are used to mitigate peristalsis. The onset and duration of their effects vary based on the medication type and administration method.<sup>6</sup> While it typically takes more than 30 minutes to acquire a complete MRE, bowel movement begins to reappear after a mean period of  $6.8 \pm 5.3$  minutes in hyoscine butylbromide intravenous (IV) group and after  $18.3 \pm 7.0$  minutes in glucagon IV group.<sup>7</sup> This means that using a single medication may result in lower image quality towards the latter part of the image acquisition due to peristalsis. To overcome this, combination of 2 medications can be used, or the medication can be split and administered both at the start and midway through the examination.

The type, amount, and method of administering oral con-

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trast agents differ between the 2 institutions participating in Bohra et al.'s study: 1.5 L of oral contrast (40 mL sorbitol 70% in 1.5 L of water), contrast consumed in 45–60 minutes prior to the scan versus 2 L of oral contrast (psyllium in 2 L of water), contrast consumed in 120 minutes prior to the scan in 30 minutes intervals. In addition, the administering method of antiperistaltic agents differ between the 2 institutions: hyoscine butylbromide 20 mg intramuscular followed by 20 mg IV versus 40 mg IV. The impact of these protocol differences between the 2 institutions on the quality of MRE is a very interesting aspect. Unfortunately, this study did not present the results of a comparison of MRE quality between the 2 institutions.

The study of Bohra et al.<sup>5</sup> reports that the image quality of MRE impacts MRE disease activity interpretation in Crohn's disease. Additionally, it reports that even in the distal small bowel, where the proportion of low-quality MRE is the lowest, it is still very high at 32.1%. The result of their study serves as a reminder to gastroenterologists and radiologists of importance of achieving high-quality MRE images. Factors affecting the quality of MRE images include, but are not limited to, the oral contrast agents and antiperistaltic agents mentioned earlier, as well as patient preparation, anatomic scan coverage, patient positioning, IV contrast agent, and MR pulse sequences. There is a relative shortfall in research on these aspects, pointing to the future need for comprehensive studies to establish an optimal protocol for high-quality MRE imaging.

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### Conflict of Interest

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### Author Contributions

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