

Multiparametric MR Enterography Without the Use of Antiperistaltic Agents: Performance and Interpretation

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Purpose

The purpose of this educational e-poster is to describe how to perform and interpret MR enterography (MRE) without using antiperistaltic agents.

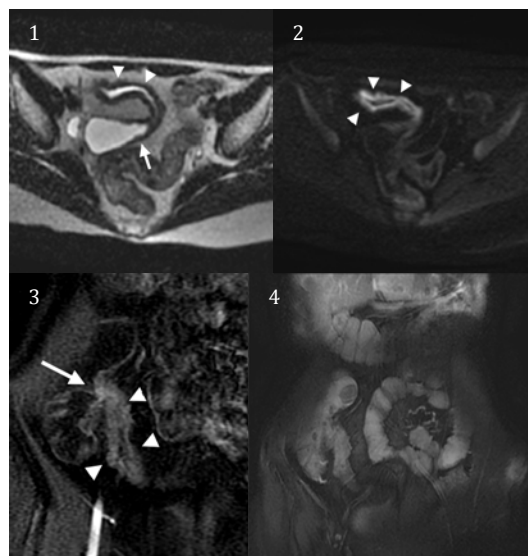
Outline of Content

- MRE without antiperistaltic agents
 - Advantages of a protocol without antiperistaltic agents
 - Major limitation of MRE without antiperistaltic agents: Motion artifact on 3D gradient echo sequences
 - While bowel motility degrades image quality when antiperistaltics are not used, MRE without antiperistaltics has high sensitivity (85%) and specificity (80%) in the evaluation of Crohn's Disease, similar to prior studies of MRE with antiperistaltics¹
 - The effect of motion artifact on diagnostic confidence may be overcome by comparing bowel on multiple pulse sequences
- MRE without antiperistaltic agents: Multiparametric approach
 - T2-weighted images and dynamic postcontrast T1-weighted images have traditionally been relied upon for small bowel evaluation²
 - Diffusion-weighted imaging and a multiphasic cine sequence are frequently not utilized,² but are valuable supplementary sequences
- Overview of sample protocol: Imaging parameters and interpretation pearls
 - T2-weighted imaging
 - Wall thickness, mural and peri-enteric edema/inflammation, fluid collections, fistulae
 - Dynamic Postcontrast 3D gradient echo imaging
 - Mucosal, mural and serosal enhancement, abscess
 - Diffusion-weighted imaging
 - Active inflammation, abscess, lymph nodes
 - Cine Balanced Steady State Free Precession Sequence
 - Small bowel peristalsis
 - How to perform and display a cine sequence
- Sample cases

Summary

There are advantages to performing MRE without antiperistaltics, including lower cost, simplicity of protocol, decreased side effects and fewer contraindications. No study has shown the diagnostic necessity of antiperistaltic agents. The major limitation of an MRE protocol without antiperistaltic agents, motion artifact on 3D gradient echo sequences, may be minimized by utilizing a multiparametric approach. Diffusion weighted imaging and a cine sequence are supplements to T2- and dynamic postcontrast T1-weighted images. With practice and by using multiple pulse sequences to make the diagnosis, interpretation of MRE without antiperistaltic agents can be as accurate as MRE with antiperistaltic agents.

1. Grand DJ et al, MR Enterography Correlates Highly with Colonoscopy and Histology for both Distal Ileal and Colonic Crohn's Disease in 310 Patients. *Eur J Radiol* 2012;81:e763-9.
2. Ziech MLW et al, Grading Luminal Crohn's Disease: Which MRI Features are Considered as Important? *Eur J Radiol* 2012;81:e467-72.



Mixed Active Inflammatory and Chronic Crohn's Disease of the Terminal Ileum: Wall thickening in the terminal ileum on the T2W image (Fig. 1). Active inflammation is indicated by diffusion restriction on the diffusion weighted sequence (Fig. 2, b=800s/mm²) and mild early mural (arrowheads) and submucosal (arrow) hyperenhancement on the post-gadolinium 3D gradient echo T1W image (Fig. 3). Note lack of image blurring of the inflamed bowel in Fig. 3. The affected segment showed absent peristalsis on the cine balanced steady state free precession sequence (Fig. 4, static image placeholder) compared to normal bowel segments.