

From Morphology to Motion: Cine-magnetic Resonance Imaging in the Functional Assessment of Pseudo-obstruction

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Article: Assessment of small bowel motility using cine-magnetic resonance imaging in patients suspected with chronic intestinal pseudo-obstruction
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Chronic intestinal pseudo-obstruction (CIPO) remains one of the most enigmatic and challenging disorders in neurogastroenterology. Defined by symptoms of mechanical obstruction without an anatomical cause, CIPO mimics other severe motility disorders, notably focal hypoganglionosis with adult-onset megacolon (FHAM).¹⁻³ Accurate differentiation between these 2 conditions is essential, as their surgical indications and prognoses are vastly different. However, traditional imaging techniques such as computed tomography (CT) provide only static snapshots and cannot adequately assess bowel function.

In this issue, Bae et al⁴ present a prospective study evaluating the clinical utility of cine-magnetic resonance imaging (cine-MRI) in patients suspected of CIPO. Among 41 patients assessed with cine-MRI, only 3 showed decreased small bowel (SB) motility, whereas 38 had normal motility. Interestingly, of the 17 patients with SB dilatation on CT—a feature traditionally associated with CIPO—only these 3 had impaired motility, while the rest had preserved function. The majority of patients with preserved motility were subsequently diagnosed with FHAM and underwent suc-

cessful surgical treatment with favorable outcomes.

This finding challenges the overreliance on CT-based assessments in pseudo-obstruction and highlights a diagnostic blind spot in current practice. Dilated bowel loops do not necessarily indicate a functional impairment, and without functional imaging, clinicians risk misclassifying potentially operable FHAM cases as inoperable CIPO, delaying curative surgery or misjudging the prognosis altogether. This aligns with recent calls to better stratify adult CIPO subgroups to tailor management strategies more effectively.⁵

Cine-MRI, a dynamic MRI sequence capturing real-time peristaltic activity, offers a radiation-free, non-invasive method of assessing SB motility. The technique has been previously explored in small studies for disorders like CIPO and Crohn's disease with small bowel strictures, showing promising correlation with clinical outcomes.⁶⁻⁹ However, few studies have integrated cine-MRI findings into a decision-making framework or compared its diagnostic value against conventional CT, especially in the context of FHAM.

In the current study, cine-MRI findings were not only diagnostic but prognostic. Patients with preserved motility had lower rates

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of postoperative recurrence, less need for continued medication, and better symptom resolution compared to those with impaired motility. Among the patients with normal SB motility who underwent surgery, all 20 had histologically confirmed focal hypoganglionosis, validating cine-MRI's role in preoperative assessment.

These results suggest that cine-MRI may help stratify patients for surgical versus conservative management. Patients with impaired motility—more likely to be true CIPO cases—often require prolonged medical therapy, parenteral nutrition, or palliative procedures. On the other hand, patients with preserved motility and radiologic evidence of focal functional narrowing can undergo segmental resection with favorable outcomes, as supported by previous Korean studies on Eastern pseudo-obstruction phenotypes.^{2,3,10}

Importantly, the study also exposes a structural limitation in current diagnostic algorithms. None of the patients underwent small bowel manometry, the traditional gold standard for evaluating motility, likely due to its invasiveness, limited availability, and technical complexity. In contrast, cine-MRI, when standardized and properly interpreted, could offer a more scalable alternative.

Nevertheless, several limitations must be acknowledged. The sample size was modest, and patients with severe bowel distension—those who might have true CIPO—were excluded due to contraindications for MRI. Moreover, the cine-MRI interpretations were conducted by a single expert radiologist using a qualitative grading system. Although efficient, this method is susceptible to inter-reader variability. Quantitative metrics, such as contraction frequency or motility indices, are under development but remain clinically impractical for widespread adoption.^{11,12}

Additionally, cine-MRI is not yet widely available. High-field scanners, protocol standardization, and reader training remain barriers to broader implementation. In the era of precision imaging, efforts should be made to establish consensus guidelines and integrate cine-MRI into diagnostic pathways for gastrointestinal dysmotility.

Despite these challenges, the study by Bae et al.⁴ represents an important step toward individualized care for patients with suspected CIPO. By introducing function-based imaging into the decision process, it bridges a long-standing gap between morphology and motility. As the field of neurogastroenterology evolves, cine-MRI may become a key modality—complementary to CT, endoscopy, and manometry—in unraveling the complex motility landscape of the bowel.

Future studies should explore multicenter validation, interobserver agreement, and direct comparisons with manometry. In parallel, technological innovation and artificial intelligence-driven analysis may further refine cine-MRI's diagnostic performance.

Until then, clinicians should consider cine-MRI not as a niche imaging tool, but as a potentially practice-changing modality in managing motility disorders.

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