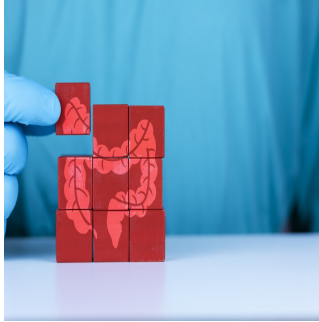

Imaging Techniques for Crohn Disease and Ulcerative Colitis



Cross-sectional imaging has become central to the diagnosis and management of small-bowel Crohn disease and ulcerative colitis. Magnetic resonance enterography (MRE) and intestinal ultrasound (US) are widely used to assess disease activity, treatment response and complications. Each modality offers distinct advantages, and selecting the appropriate imaging method depends on the clinical scenario. A recent review published in *Radiology* explores the role of MRE and US in evaluating Crohn disease, discusses their comparative benefits and highlights their application in ulcerative colitis. Careful consideration of imaging techniques enhances diagnostic precision and aids in developing personalised treatment strategies.

Selecting the Appropriate Imaging Modality

MRE and intestinal US are primary imaging tools for Crohn disease due to their accuracy and lack of ionising radiation. MRE provides a comprehensive assessment of disease extent, including transmural and extramural involvement, making it particularly useful for staging and monitoring complex diseases. It is particularly beneficial when detailed anatomical visualisation is required, allowing for the assessment of deep bowel layers and adjacent mesenteric involvement. Intestinal US, on the other hand, is more accessible, well-tolerated and effective for routine monitoring. Its real-time capabilities allow for the evaluation of peristalsis and changes in bowel structure without requiring the use of contrast agents, making it an attractive option for frequent monitoring.

CTE remains a valuable option in acute presentations or when MRE is unavailable, particularly in emergencies where perforation is suspected. However, concerns over cumulative radiation exposure limit its long-term use. The choice between these modalities depends on patient-specific factors, clinical indications and availability of expertise. MRE is often the preferred choice for initial diagnosis and assessing disease distribution, while intestinal US is particularly effective in monitoring known disease progression.

Assessing Disease Activity and Treatment Response

Both MRE and intestinal US effectively identify key features of active Crohn disease, including bowel wall thickening, mural oedema and increased vascularity. MRE is particularly adept at detecting deep ulcerations, strictures and penetrating complications such as fistulas and abscesses. Its ability to provide detailed multiplanar images allows for a better assessment of disease severity, making it invaluable for guiding therapeutic decisions. Intestinal US excels in assessing peristalsis, mesenteric fat changes and bowel stratification in real time. This allows for immediate recognition of active inflammation and facilitates rapid clinical decision-making.

When monitoring treatment response, imaging findings guide therapeutic adjustments. MRE provides additional insights into bowel motility changes, which correlate with treatment efficacy. Reduced peristalsis and persistent bowel wall thickening suggest ongoing inflammation, whereas improvements in motility and reduction in mural oedema indicate successful treatment response. Intestinal US, given its ease of use and accessibility, is increasingly employed for frequent monitoring, particularly in patients with established disease distribution. Its ability to provide immediate feedback allows clinicians to adjust treatment strategies more effectively, reducing the need for invasive endoscopic assessments.

Comparing Imaging in Crohn Disease and Ulcerative Colitis

Although MRE is primarily used for Crohn disease, its application in ulcerative colitis is also noteworthy. MRE can detect inflammation and assess disease extent, particularly in cases where endoscopic evaluation is incomplete or contraindicated. It offers high-resolution imaging of the bowel wall and mesentery, allowing for a thorough assessment of disease severity. However, its use in ulcerative colitis is somewhat limited compared to its role in Crohn disease, as ulcerative colitis primarily affects the mucosal layer.

Intestinal US has demonstrated significant utility in monitoring ulcerative colitis, offering a high spatial resolution for bowel wall assessment. This allows for the identification of features such as mucosal thickening and increased vascularity, which correlate with disease activity. The ability of intestinal US to provide a detailed evaluation of the superficial bowel layers is highly beneficial, as ulcerative colitis is predominantly a mucosal disease. The rapid assessment and real-time imaging capabilities of intestinal US contribute to its growing adoption for monitoring ulcerative colitis, particularly in acute and outpatient settings. Additionally, the non-invasive nature of US makes it a preferred choice for long-term disease surveillance, reducing the need for repeated colonoscopies.

Cross-sectional imaging is an indispensable component of inflammatory bowel disease management, particularly in Crohn disease and ulcerative colitis. MRE and intestinal US provide complementary insights into disease activity, complications and treatment response, enabling a more tailored and effective approach to patient care. While MRE offers detailed anatomical assessment and superior evaluation of complex cases, intestinal US is a highly accessible and patient-friendly modality for ongoing disease monitoring.

By optimising imaging selection and interpretation, clinicians can improve diagnostic accuracy and enhance disease monitoring, ultimately contributing to better patient outcomes. The continuous advancement of imaging techniques and refinement of diagnostic protocols will further strengthen the role of cross-sectional imaging in managing inflammatory bowel disease. The reliance on frequent endoscopic procedures may decrease, allowing for more patient-centred approaches in disease management.

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