Perspectives & Commentary

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Misdiagnosis of Idiopathic Mesenteric Phlebosclerosis: The Role of AI-Assisted Computed Tomography Pattern Recognition

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ABSTRACT

Idiopathic mesenteric phlebosclerosis (IMP) is a rare form of chronic ischemic colitis that is frequently misdiagnosed due to its nonspecific clinical presentation and overlap with more common gastrointestinal conditions such as inflammatory bowel disease and ischemic colitis. Despite the presence of characteristic computed tomography (CT) findings, including serpiginous mesenteric venous calcifications and colonic wall thickening, delayed or incorrect diagnosis remains common, particularly in non-endemic regions and low-volume centers. This commentary builds upon a recently published case report to highlight the limitations of conventional diagnostic pathways and the downstream consequences of misdiagnosis, including inappropriate immunosuppressive therapy and delayed definitive management. We propose that artificial intelligence–assisted CT pattern recognition may serve as a valuable adjunct in the early identification of IMP by enhancing detection of subtle, disease-specific imaging patterns that may be overlooked during routine interpretation. Integration of AI-based decision support tools into radiologic workflows has the potential to improve diagnostic accuracy, reduce unnecessary interventions, and support preventive strategies by enabling earlier disease recognition. Further multicenter studies are warranted to evaluate the clinical utility and generalizability of AI-assisted imaging approaches in rare vascular gastrointestinal diseases.

1. Introduction

Idiopathic mesenteric phlebosclerosis (IMP) is a rare and underrecognized form of chronic ischemic colitis characterized by progressive sclerosis and calcification of mesenteric veins, most commonly affecting the right colon. Despite its distinct radiologic features, IMP is frequently misdiagnosed as inflammatory bowel disease (IBD), ischemic colitis, or colorectal malignancy, resulting in delayed or inappropriate management. A recent case report by Hou et al. highlights this diagnostic challenge by describing extensive IMP presenting as intestinal pseudo-obstruction, underscoring the continued difficulty in distinguishing this entity from more common gastrointestinal pathologies using conventional diagnostic paradigms [1].

IMP has been reported predominantly in East Asian populations, though increasing incidental detection in Western cohorts suggests that the disease may be globally underdiagnosed rather than geographically confined [2]. Clinical presentation is often nonspecific, with symptoms including abdominal pain, altered bowel habits, and obstructive features that closely overlap with IBD and other colitides [3]. While computed tomography (CT) can demonstrate characteristic findings—such as serpiginous calcifications along mesenteric veins, colonic wall thickening, and mesenteric congestion—these features may be subtle or misinterpreted, particularly in centers with limited exposure to rare vascular colonic diseases [4].

2. Limitations of Conventional Diagnostic Pathways

Conventional diagnostic strategies remain inherently limited in IMP. Endoscopic biopsies typically reveal nonspecific ischemic or fibrotic changes and do not adequately assess mesenteric venous pathology, frequently leading to diagnostic ambiguity [5]. As a result, patients are often exposed to prolonged empiric treatment with corticosteroids or biologic agents intended for IBD, therapies that provide no benefit in IMP and may delay appropriate surgical intervention. In some cases, this delay contributes to disease progression, complications, and poorly timed operative management.

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3. Potential Role of AI-Assisted CT Pattern Recognition

Recent advances in artificial intelligence (AI)–assisted imaging offer a potential solution to this diagnostic gap. AI-based CT pattern recognition systems have demonstrated high accuracy in identifying complex and subtle radiologic features across multiple disease domains, often performing comparably to expert radiologists while reducing interobserver variability [6]. Applied to IMP, such models could be trained to detect characteristic venous calcification patterns and spatial distributions that distinguish IMP from inflammatory or neoplastic conditions. Earlier and more reliable identification could facilitate appropriate conservative management, improve surgical planning when necessary, and reduce unnecessary exposure to ineffective medical therapies.

4. Future Directions and Research Needs

In summary, IMP exemplifies how rare diseases remain vulnerable to misdiagnosis when diagnostic frameworks rely heavily on clinician familiarity and nonspecific histopathologic findings. Integrating AI-assisted CT pattern recognition into routine imaging workflows may represent a meaningful advance in improving diagnostic precision for IMP. Prospective, multicenter validation studies are needed to determine the real-world clinical impact of these technologies and to define their role in the diagnostic pathway of rare vascular gastrointestinal diseases.

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