

Diagnostic Modalities for Inflammatory Bowel Disease: Serologic Markers and Endoscopy



Clarence Clark, MD, Jacquelyn Turner, MD*

KEYWORDS

• Serologic markers • Endoscopy • Inflammatory bowel disease

KEY POINTS

- Perinuclear antineutrophil cytoplasmic antibody is associated with ulcerative colitis; anti-*Saccharomyces cerevisiae* mannan antibodies are more commonly detected in patients with Crohn's disease (CD).
- Deep endoscopy is a useful tool for detection and surveillance of small bowel CD.
- Video capsule endoscopy and colon capsule endoscopy are promising modalities for gastrointestinal evaluation.
- Chromoendoscopy and confocal laser endomicroscopy allow for targeted biopsies which have shown to detect more intraepithelial neoplasms with fewer biopsy specimens.
- Endoscopic scoring systems help to increase intraobserver agreement of disease activity and severity among endoscopists.

INTRODUCTION

As endoscopic technology and advances in laboratory assays have evolved in the past two decades, better understanding of the pathogenesis and natural history of inflammatory bowel disease (IBD) has emerged. Central to these medical advances is the ability to discriminate between the subtypes of IBD (Crohn's disease [CD], ulcerative colitis [UC], and indeterminate colitis) especially when limited to the colon. Gross endoscopic and histologic findings in concert with serologic markers are critical to medicine and surgical specialties treating persons with these conditions. Herein, we examine the current literature as it pertains to endoscopy and serology as diagnostic tools for IBD.

The authors have nothing to disclose.

Department of Surgery, Division of Colon and Rectal Surgery, Morehouse School of Medicine, 720 Westview Drive Southwest, Atlanta, GA 30310, USA

* Corresponding author.

E-mail address: jturner@msm.edu

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RELEVANT ANATOMY AND PATHOPHYSIOLOGY

Essential to the pathogenesis of IBD is the epithelial barrier of the gastrointestinal tract. This first line of defense is composed of a mucinous layer coupled with an epithelium that produces antimicrobial peptides that limit bacterial invasion.¹ Damage to the epithelial barrier leads to increased permeability and an increased uptake of luminal antigens. This process is often regarded as a key stage in the pathogenesis of IBD.

Pathologic features of UC include mucin depletion, erosion, and ulceration. Crypt architecture in UC is often distorted in addition to crypt branching, decreased crypt density, and crypt abscesses. Crypt architecture abnormalities are more common in UC than CD (57%–100% of cases compared with 21%–71% of cases, respectively).² At the level of the lamina propria, UC is notable for transmucosal inflammation and basal plasmacytosis.^{1,2} In contrast, granulomas are characteristic of CD and be present in 21% to 37% of specimens taken.² Crypt architecture in CD includes segmental crypt atrophy and distortion. Both CD and UC have increased basal lamina propria cellularity and basal plasmacytosis.

CLINICAL PRESENTATION

Tables 1 and **2** and **Fig. 1–5** detail the clinical presentation of IBD.

SEROLOGIC MARKERS AS DIAGNOSTIC MODALITIES FOR INFLAMMATORY BOWEL DISEASE

Increased exposure to environmental microbiota and inflammatory response to common environmental pathogens have been implicated in the pathogenesis of IBD.^{2–7} This association has led to a host of studies identifying serologic markers to these antigens for diagnosis and differentiation of the various subtypes of IBD. In this section, we review these serologic markers and the evidence for their use in the diagnosis and management of IBD.

Atypical Perinuclear Antineutrophil Cytoplasmic Antibody

Atypical perinuclear antineutrophil cytoplasmic antibody (pANCA) is a type of antibody that targets antigens present on azurophilic granules of polymorphonuclear leukocytes with a perinuclear staining pattern.⁸ A number of studies have demonstrated

Table 1
Signs and symptoms of inflammatory bowel disease

| Ulcerative Colitis | Crohn's Disease |
|--|---|
| <ul style="list-style-type: none"> • Disease confined to the colon; colonic involvement is usually left sided • Rectosigmoid colon is invariably involved • Chronic, episodic • Increased risk of colon cancer • Bloody stools • Tenesmus/fecal urgency • Abdominal pain • Fever • Nocturnal diarrhea • Frequent small bowel movements | <ul style="list-style-type: none"> • Small bowel is involved in 80% of cases; right sided colonic involvement • Rectosigmoid junction is often spared • Chronic, episodic • Perianal disease • Fistulizing • Bowel obstruction • Increased risk of colon cancer • Nausea/vomiting • Weight loss • Severe malabsorption • Bloody stools • Abdominal pain |

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