Current role of endoscopy in inflammatory bowel disease diagnosis and management

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Purpose of review
This review will summarize the role of endoscopy in the diagnosis of inflammatory bowel disease (IBD), in assessing its activity, its management, interventional endoscopy, and cancer surveillance.

Recent findings
Endoscopy in IBD underwent major advances in the recent years, with the emergence of new techniques such as wireless video capsule endoscopy (WCE), device-assisted enteroscopy (DAE), chromoendoscopy, and confocal endomicroscopy. WCE is a minimally invasive tool, enabling the visualization of the entire small bowel mucosa. It has gained a substantial role in the evaluation of patients with suspected Crohn’s disease and indeterminate colitis. With the correct use of the International Conference on Capsule Endoscopy criteria, WCE has a high positive predictive value in patients with suspected Crohn’s disease. Moreover, WCE has a very high negative predictive value in patients with suspected Crohn’s disease. DAE has established its role as a complementary tool in cases where there is need of biopsies or dilatation of strictures. Chromoendoscopy and confocal endomicroscopy are techniques that may assist in cancer surveillance in IBD patients.

Summary
Endoscopy has a major role in the diagnosis of IBD, assessing its extent, treating some of its complications, assessing the success of various treatments, and as a predictor of disease course.

Keywords
Crohn’s disease, device-assisted enteroscopy, small bowel capsule endoscopy, ulcerative colitis

INTRODUCTION
Endoscopy has a major role in the diagnosis of inflammatory bowel disease (IBD), ruling out other diseases and differentiating Crohn’s disease from ulcerative colitis. Endoscopy has also a role in evaluating disease extent, in the evaluation of treatment efficacy (mucosal healing), and in assessing the risk for postsurgical recurrence. Other possible roles of endoscopy in IBD include cancer surveillance and treatment of some complications such as strictures and bleeding. The following list describes the role of endoscopy in IBD.

(1) Assists in the diagnosis of IBD
(2) Defines disease activity
(3) Defines disease distribution/extent
(4) Assessment of treatment success (mucosal healing)
(5) A prognostic tool:
   (a) Pretreatment – deep ulcers
   (b) Post-treatment – mucosal healing
   (c) Postsurgery – Rutgeerts’ score
(6) Cancer surveillance (with or without chrohoendoscopy)
(7) Treatment: stricture dilatation and bleeding

In the recent years, bowel imaging and endoscopy in IBD underwent major progress with the appearance of advanced technologies such as wireless video capsule endoscopy (WCE), balloon-assisted enteroscopy, chromoendoscopy, and confocal endomicroscopy. However, ileocolonoscopy still remains essential to the diagnosis and treatment of IBD.

Recently, new guidelines for endoscopy in IBD were published by the European Crohn’s and Colitis

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Endoscopy has a major role in the diagnosis of IBD, assessment of its extent, treating strictures and bleeding, assessing the success of various treatments, and as a predictor of disease course.

Ileocolonoscopy is the most important tool for the diagnosis of ulcerative colitis, Crohn’s colitis, and ileitis.

In the proper settings, WCE has a high positive predictive value in patients with suspected Crohn’s disease.

A normal capsule exam has a very high negative predictive value in patients with suspected Crohn’s disease.

Device-assisted enteroscopy has a role as a complementary tool in cases where there is need of biopsies or dilatation of strictures.

Chromoendoscopy and confocal endomicroscopy may assist in cancer surveillance in IBD patients.

The endoscopic hallmark of Crohn’s disease is the patchy distribution of inflammation with skip lesions. Other common signs include mucosal cobblestoning, aphthous ulcers, and rectal sparing. The classic distribution includes involvement of the small bowel/terminal ileum (80%), colon (50%), and rectal sparing (50%). In 20% of patients, the disease affects only the colon. Therefore, ileocolonoscopy should be considered as the first examination when IBD is suspected. Upper gastrointestinal (UGI) tract inflammation has become increasingly recognized, even in the absence of specific localizing symptoms in IBD patients. The involvement of the stomach and the duodenum has been reported in up to 3% of adult patients with ileocolonic disease [4]. In the pediatric population with suspected IBD, UGI endoscopy is mandatory as UGI involvement may reach up 50% [5]. In adult IBD patients, UGI endoscopy may have a role in establishing the diagnosis of Crohn’s disease, assessing disease extension and severity, and aiding in choosing the right therapy, or when patients present with dyspepsia, abdominal pain, and vomiting. In some ethnic groups such as African Americans, UGI involvement may reach 20% [6]. The question whether esophagogastroduodenoscopy should be performed routinely in asymptomatic adult patients remains unclear [1**].

The proximal small bowel seems to be affected in >50% of Crohn’s disease patients on capsule endoscopy examinations, and up to 30% of newly diagnosed Crohn’s disease cases have disease limited to the small bowel beyond the reach of ileocolonoscopy [7], necessitating the use of advanced endoscopic techniques to visualize and obtain histology. These include WCE and device-assisted enteroscopy (DAE). Proximal small bowel (jejunal) involvement carries a worse prognosis with more relapses, hospitalizations, and surgery [8,9**].

WCE is a method of endoluminal examination of the small bowel using a wireless capsule-shaped tool, which is usually swallowed and then propelled through the gastrointestinal tract by gut motility (Fig. 1) [10]. WCE enables visualization of the whole small bowel in over 85% of cases, even without any bowel preparation [11]. The value of WCE lies in its minimal invasiveness and in the high rate of diagnostic accuracy as well as a very high negative predictive value when reported normal [1**]. Preselecting patients using the criteria suggested by the International Conference on Capsule Endoscopy (ICCE) study group such as chronic diarrhea and pain, weight loss, extra intestinal manifestations (perianal disease), raised inflammatory markers, or increased levels of fecal calprotectin have been described to improve the specificity and positive predictive value of the test [12,13,14*]. In a meta-analysis, WCE was
found to be superior to push enteroscopy, small bowel follow through and computed tomographic enterography (CTE) in the evaluation of patients with established Crohn’s disease [15]. In a prospective blinded study of multiple small-bowel imaging modalities comparing WCE, CTE, and magnetic resonance enterography (MRE), the sensitivity and specificity for terminal ileum Crohn’s disease were 100% and 91% for WCE, 76% and 85% for CTE, and 81% and 86% for MRE, respectively, and the capsule significantly enhanced the detection of small bowel lesions proximal to the terminal ileum [16]. Moreover, WCE may be also superior to MRE for early mucosal lesions and for proximal small bowel lesions [17]. This fact is meaningful because mucosal inflammation is an early sign of Crohn’s disease, preceding the development of strictures and fistulas, and early diagnosis and treatment may lead to better outcomes [18]. Capsule retention is the main potential complication of WCE, occurring in up to 1.4% of patients with suspected Crohn’s disease and in up to 13% of patients with established Crohn’s disease [19,20]. In a recent prospective study comparing WCE to small bowel follow through and ileocolonoscopy in patients with suspected Crohn’s disease, the capsule was given as the first modality in almost 100 patients, with no evidence of retention [21**]. The risk of capsule retention may be decreased by using the Agile patency capsule prior to the use of the regular capsule. If the patency capsule is secreted intact, the regular capsule will probably pass without any problems.

DAE is a generic term for an endoluminal examination of the small bowel by any endoscopic technique that includes assisted progression and includes push enteroscopy, single and double balloon enteroscopy, spiral enteroscopy, or intraoperative enteroscopy (Fig. 2) [22]. DAE can be used to diagnose Crohn’s disease when in doubt, because histological validation becomes available. The diagnostic yield of DAE when evaluating patients for suspected Crohn’s disease varies between 22% and 70% [23,24]. It is even higher if the indication for DAE is based on at least one positive previous investigation [23]. Prospective trials that compared DAE to MRE and WCE found correlations of 88–75% and 67%, respectively [25,26]. At present, DAE is recommended only when conventional studies including ileocolonoscopy, small bowel capsule endoscopy (SBCE), and radiographic imaging are inconclusive or histological diagnosis would alter disease management or both [1**].

**ENDOSCOPIC ASSESSMENT OF DISEASE SEVERITY**

Endoscopy can assess the severity of IBD. In ulcerative colitis, the clinical impression of severity correlates poorly with endoscopic mucosal findings and histology. Multiple endoscopic scoring methods have been designed to classify the severity of ulcerative colitis [27–31] (Table 1). Patients with inactive ulcerative colitis have normal mucosa with clearly visible vascular pattern. Mild disease consists of...
erythema, decreased vascular pattern, and mild friability. Moderate disease is defined as moderate friability with mild contact bleeding, no spontaneous bleeding, and granularity. Severe colitis is seen as spontaneous bleeding from the mucosa. Recently, intrainvestigator and interinvestigator reliability of the Ulcerative Colitis Endoscopic Index of Severity (UCEIS) was examined and found to be satisfactory, reaching a high level of correlation with the assessment of disease severity [32].

Few validated scores have been developed for luminal Crohn’s disease. The Crohn’s Disease Endoscopic Index of Severity (CDEIS) has been used as a marker of mucosal healing in a number of therapeutic trials. It is based on the recognition of elementary lesions (nonulcerated lesions, superficial, and deep ulcerations) associated with the appreciation of their surface in five segments (ileum, right colon, transverse, left colon and sigmoid, and rectum; Table 2) [33]. Although reliable and reproducible, it is time consuming, thus making this score unsuitable for everyday clinical practice. The simple endoscopic score for Crohn’s disease (SESCD) is based on four endoscopic variables to be scored 0–3 in the same five ileocolonic segments considered in the CDEIS. This score correlates well with the CDEIS, but it is easier and faster to score and calculate than the CDEIS, and its results are reproducible and reliably correlating with the present standard [34]. Two scores have been published and validated to quantify the inflammatory burden in the small bowel: the so-called ‘Lewis score’ embedded in the Given Imaging software and the Capsule Endoscopy Crohn’s Disease Activity Index [14,35]. Retrospective studies have shown that the higher the Lewis score, the higher the likelihood of the patient to have proven Crohn’s disease in the follow-up period [36].

THE ROLE OF ENDOSCOPY IN THE MANAGEMENT OF INFLAMMATORY BOWEL DISEASE

Endoscopy is an important tool in evaluating response to therapy, disease flares, and postoperative recurrence. Obtaining endoscopic and histologic records of disease activity is also routinely performed before the escalation or change of treatment in order to monitor future response to the treatment. Endoscopic reassessment should be considered in cases of relapse, refractoriness, new symptoms, or when surgery is considered [1**]. There is growing evidence in both Crohn’s disease and ulcerative colitis that achieving mucosal healing during therapy is a sign of a good efficacy of a drug, reducing the frequency of surgery and hospitalizations [37,38]. Several investigators have tried to define a minimal degree of endoscopic improvement that is relevant for improving the long-term outcome. A CDEIS score of less than 6 was defined as endoscopic remission, and complete endoscopic remission was defined as CDEIS <4 by some studies [2]. A CDEIS decrease of at least six points defines endoscopic response [2,39]. Recently, in a post-hoc analysis of data from the SONIC trial, a SESCD defining endoscopic response was a decrease of at least 50% of the initial score at week 26 [40]. STORI trial looking at relapses of Crohn’s disease after withdrawing anti-TNF therapy in patients in remission found that a CDEIS of 0 predicted good outcome with no relapse [41].

As mentioned earlier, WCE may also have an important role in determining small bowel mucosal healing, as it enables detection of superficial small bowel lesions. Endoscopy also has a role in defining the risk for postoperative recurrence in Crohn’s disease patients who underwent ileal resection and ileocolonic anastomosis. The course of the disease was best predicted by the severity of the early postoperative lesions on the anastomosis or on the neoterminal ileum or both [42]. The severity of the lesions is assessed by using the ‘Rutgeerts’ score’ [42]. Patients with less severe endoscopic lesions (score 1 or less) had a lower risk of clinical recurrence risk (9% at 4 years) compared with patients with severe endoscopic recurrence (score 2 or more) (100% at 4 years). Therefore, ileocolonoscopy is recommended 6–12 months after surgery when treatment decisions may be affected [1**]. Recently, noninvasive strategies for the assessment of early disease recurrence have been described. WCE may
<table>
<thead>
<tr>
<th>Descriptor (score most severe lesions)</th>
<th>Likert scale anchor points</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vascular pattern</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal (1)</td>
<td></td>
<td>Normal vascular pattern with arborization of capillaries clearly defined</td>
</tr>
<tr>
<td>Patchy loss (3)</td>
<td></td>
<td>Patchy loss or blurring of vascular pattern</td>
</tr>
<tr>
<td>Obliterated (5)</td>
<td></td>
<td>Complete loss of vascular pattern</td>
</tr>
<tr>
<td>Mucosal erythema</td>
<td></td>
<td></td>
</tr>
<tr>
<td>None (1)</td>
<td></td>
<td>The color of the mucosa is normal</td>
</tr>
<tr>
<td>Light red (3)</td>
<td></td>
<td>Some increase in color of the mucosa that is probably abnormal, but would be best compared side-by-side with a normal examination</td>
</tr>
<tr>
<td>Dark red (5)</td>
<td></td>
<td>Red or crimson color of the mucosa that is similar to blood – that is, clearly abnormal even if not compared with a normal examination (does not include intramucosal hemorrhage)</td>
</tr>
<tr>
<td>Mucosal surface (granularity)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal (1)</td>
<td></td>
<td>Smooth mucosa with a sharp light reflex, similar to a polished surface</td>
</tr>
<tr>
<td>Granular (3)</td>
<td></td>
<td>Mucosal surface diffuses reflected light causing minor variation in the surface</td>
</tr>
<tr>
<td>Nodular (5)</td>
<td></td>
<td>Evident nodular variation in mucosal surface</td>
</tr>
<tr>
<td>Mucosal edema</td>
<td></td>
<td></td>
</tr>
<tr>
<td>None (1)</td>
<td></td>
<td>Normal appearance: no white or yellow substance visible</td>
</tr>
<tr>
<td>Probable (3)</td>
<td></td>
<td>Slight swelling and thickening of mucosa</td>
</tr>
<tr>
<td>Definite (5)</td>
<td></td>
<td>Marked thickening and edema of the mucosa with blunting of the mucosal folds</td>
</tr>
<tr>
<td>Mucopus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>None (1)</td>
<td></td>
<td>Normal appearance: no white or yellow substance visible</td>
</tr>
<tr>
<td>Some (3)</td>
<td></td>
<td>White or yellow deposits on the mucosa unrelated to any bowel preparation</td>
</tr>
<tr>
<td>Lots (5)</td>
<td></td>
<td>Mucopus substantially covering the mucosal surface unrelated to any bowel preparation</td>
</tr>
<tr>
<td>Bleeding</td>
<td></td>
<td></td>
</tr>
<tr>
<td>None (1)</td>
<td></td>
<td>No visible blood</td>
</tr>
<tr>
<td>Mucosal (2)</td>
<td></td>
<td>Some spots or streaks of coagulated blood on the surface of the mucosa ahead of the scope, which can be washed away</td>
</tr>
<tr>
<td>Luminal mild (3)</td>
<td></td>
<td>Some free liquid blood in the lumen</td>
</tr>
<tr>
<td>Luminal moderate (4)</td>
<td></td>
<td>Frank blood in lumen ahead of endoscope or visible oozing from mucosa after washing intraluminal blood</td>
</tr>
<tr>
<td>Luminal severe (5)</td>
<td></td>
<td>Frank blood in the same lumen with visible oozing from a hemorrhagic mucosa</td>
</tr>
<tr>
<td>Incidental friability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>None (1)</td>
<td></td>
<td>No bleeding or intramucosal hemorrhage before or after passage of the endoscope</td>
</tr>
<tr>
<td>Mild (2)</td>
<td></td>
<td>No bleeding at the site of assessment before, but minor bleeding or intramucosal hemorrhage after passage of the endoscope</td>
</tr>
<tr>
<td>Moderate (3)</td>
<td></td>
<td>Intramucosal hemorrhage without overt bleeding before passage of the endoscope</td>
</tr>
<tr>
<td>Severe (4)</td>
<td></td>
<td>Overt bleeding after passage of the endoscope</td>
</tr>
<tr>
<td>Very severe (5)</td>
<td></td>
<td>Overt bleeding from the mucosa</td>
</tr>
<tr>
<td>Contact friability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>None (1)</td>
<td></td>
<td>No bleeding from the mucosa after light touch with closed biopsy forceps</td>
</tr>
<tr>
<td>Probable (3)</td>
<td></td>
<td>Intramucosal hemorrhage or minor bleeding after light touch with closed biopsy forceps</td>
</tr>
<tr>
<td>Definite (5)</td>
<td></td>
<td>Overt bleeding mucosa after light touch (within 10 s) with closed biopsy forceps</td>
</tr>
<tr>
<td>Erosions and ulcers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>None (1)</td>
<td></td>
<td>Normal mucosa, no visible erosions or ulcers</td>
</tr>
<tr>
<td>Erosions (2)</td>
<td></td>
<td>Tiny (≤5 mm) defects in the mucosa, of a white or yellow color with a flat edge</td>
</tr>
<tr>
<td>Superficial ulcer (3)</td>
<td></td>
<td>Larger (&gt;5 mm) defects in the mucosa, which are discrete fibrin-covered ulcers in comparison with erosions, but remain superficial</td>
</tr>
<tr>
<td>Deep ulcer (4)</td>
<td></td>
<td>Deeper excavated defects in the mucosa, with a slightly raised edge</td>
</tr>
<tr>
<td>Extent of erosions or ulcers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>None (1)</td>
<td></td>
<td>None seen during endoscopy</td>
</tr>
<tr>
<td>Limited (2)</td>
<td></td>
<td>&lt;10% of the affected mucosa</td>
</tr>
</tbody>
</table>
help to identify disease activity in symptomatic patients with established Crohn’s disease. In two retrospective studies, SBCE findings led to treatment escalation in the majority of patients [43,44].

Similar to Crohn’s disease, in ulcerative colitis therapy is also directed toward mucosal healing as an end point, as it seems to offer better prognosis compared to symptomatic control alone [45]. In clinical trial settings, the definition of mucosal healing differs between light erythema, granularity and/or friability [46], to a more stringent sign of mucosa with no ulceration, both microscopic and macroscopic [27]. The use of magnifying chromoendoscopy and confocal endomicroscopy as a tool to identify complete remission has also been suggested. In a prospective study of patients who had achieved clinical and endoscopic remission, crypt opening abnormalities seen with magnifying chromoendoscopy were associated with relapse over 12 months [47]. Confocal microendoscopy allowed observation of cellular and subcellular structures. Images taken with the confocal microendoscope provided information that was equivalent to conventional histology and better than the routine endoscopy in differentiating between normal controls as well as between active and nonactive ulcerative colitis patients during endoscopy [48].

ENDOSCOPIC INTERVENTIONS IN INFLAMMATORY BOWEL DISEASE

Small bowel strictures occur in approximately 25% of Crohn’s disease patients, and colonic strictures in about 10% [49]. In the small bowel, strictures tend to arise at the site of surgical anastomosis, in the terminal ileum or at the ileocecal valve. For active inflammatory strictures, medical treatment should be optimized. Symptomatic fibrotic strictures in Crohn’s disease can be safely and effectively dilated by endoscopic techniques [1**]. Balloon dilatation of strictures typically involves balloons between 5 and 8 cm in length and up to 25 mm in diameter, stricture length of ≤4 cm, and anastomotic strictures have been associated with better dilatation outcome [50]. The reported technical success rates reach 90%, with only 3% having complications [51]. Strictures recur following dilatations, and repeated dilatations may be needed in up to 50% by 5 years [1**]. Intralesional injections of steroids or infliximab have not yet been proven to prolong the time to re-dilatation of strictures [52]. Colonic strictures in IBD patients should be considered malignant until proven otherwise, as malignancy was reported in 29% of ulcerative colitis patients with colonic strictures and in 6.8% of Crohn’s disease patients [53,54].

CANCER SURVEILLANCE IN INFLAMMATORY BOWEL DISEASE

Patients with longstanding ulcerative colitis or colonic involvement in Crohn’s disease are at increased risk of developing dysplasia and colorectal cancer (CRC). Recent studies found that the risk is of up to 0.6% after 10 years and up to 7.5% after 30 years [55,56]. High risk for CRC is found in patients with active and extensive disease, severe disease, longer disease duration, young age of onset, backwash ileitis, family history of CRC, and with concurrent sclerosing cholangitis [57,58]. Screening colonoscopy is recommended after 8–10 years from the onset of disease [1**]. Patients with high-risk features (stricture or dysplasia detected within the past 5 years, primary sclerosing cholangitis, extensive colitis with severe active inflammation, or a

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**Table 1.** Endoscopic scoring system for Crohn’s disease – CDEIS

<table>
<thead>
<tr>
<th>Descriptor (score most severe lesions)</th>
<th>Likert scale anchor points</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substantial (3)</td>
<td>10–30% of the affected mucosa</td>
<td></td>
</tr>
<tr>
<td>Extensive (4)</td>
<td>&gt;30% of the affected mucosa</td>
<td></td>
</tr>
</tbody>
</table>

CDEIS, Crohn’s Disease Endoscopic Index Severity. Total A = Total 1 + Total 2 + Total 3 + Total 4. n = Number of segments explored (partially or totally), B = total A/n, C = If ulcerated stenosis is present add 3, and D = If a nonulcerated stenosis is present add 3. CDEIS = B + C + D.

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**Table 2.** Endoscopic scoring system for Crohn’s disease – CDEIS

<table>
<thead>
<tr>
<th>Rectum</th>
<th>Sigmoid and left colon</th>
<th>Transverse colon</th>
<th>Right colon</th>
<th>Ileum</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deep ulcerations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Total 1</td>
</tr>
<tr>
<td>Superficial ulcerations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Total 2</td>
</tr>
<tr>
<td>Surface involved by the disease (cm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Total 3</td>
</tr>
<tr>
<td>Surface involved by ulcerations (cm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Total 4</td>
</tr>
</tbody>
</table>
Inflammatory bowel disease

family history of CRC in a first-degree relative at less than 50 years old) should have repeat colonoscopy in 1 year. Patients with intermediate risk factors (extensive colitis with mild or moderate active inflammation, inflammatory polyps, or a family history of CRC in a first-degree relative at 50 years and above) should repeat colonoscopy after 2–3 years. Patients with neither intermediate nor high-risk features should repeat their colonoscopy after 5 years [1**,2]. The yield of surveillance colonoscopy can be improved by spraying methylene blue or indigo carmine [1**,2,59]. However, if chromoendoscopy is not available, random biopsies (four every 10 cm) should be performed. The use of other techniques such as narrow band imaging or autofluorescence cannot as yet be recommended for colitis surveillance, as they have not been demonstrated to be superior to standard endoscopy for the detection of neoplastic lesions [1**,2]. Sporadic adenomas (not in the area of inflammation) and well-circumscribed visible lesions (adenoma-like lesions) may be resected endoscopically regardless to their location [60,61]. The diagnosis of high-grade intraepithelial lesions or carcinoma without an associated endoscopically visible lesion is accepted as an indication for total colectomy [1**,2].

CONCLUSION

Endoscopy is an important tool in the diagnosis and management of IBD. Endoscopy assists in the evaluation of disease activity, severity, and extent, as well as response to therapy and mucosal healing. Therapeutic endoscopy has a role in the treatment of the complications of IBD and can avoid the need for bowel resection. Finally, endoscopy has a crucial role in CRC surveillance, with the use of chromoendoscopy that can improve dysplasia detection rate.

Acknowledgements

None.

Conflicts of interest

The authors declare no conflict of interests regarding this article.

REFERENCES AND RECOMMENDED READING

Papers of particular interest, published within the annual period of review, have been highlighted as:

- of special interest
- of outstanding interest


A comprehensive state of the art ECCO consensus on the appropriate indication and application of different endoscopic modalities in IBD.


In this retrospective study, the prevalence of jejunal lesions in Crohn’s disease patients was evaluated with a SBCE. Jejunal lesions were found in more than 50% of patients. Jejunal involvement was associated with an increased risk of further clinical relapse.


This retrospective study demonstrates that when one uses the ICCC criteria to preselect patients suspected to have SBCCD, one can increase the probability of having substantial small bowel inflammation and the probability of it to be proven Crohn’s disease.


In this prospective study, SBCE was better than SBFT and equivalent to ileocolonoscopy in detecting small-bowel inflammation.


This study assessed the reliability of the Ulcerative Colitis Endoscopic Index of Severity (UCEIS). The intrainvestigator and interinvestigator reliability were found to be satisfactory.


In this prospective study, approximately 50% of Crohn’s disease patients who were treated for at least 1 year with infliximab and an antitumor/biologic agent experienced a relapse within 1 year after discontinuation of infliximab.


