Endoscopy in IBD: How far can you go!

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How far can you go!
Introduction

• Endoscopy in IBD: crucial tool
  • Correct diagnosis
  • Adequate assessment of disease activity
  • Assessment of treatment success
  • Avoidance of surgery by endoscopic interventions
  • Effective cancer surveillance
• Traditional white light endoscopy
• Newer advances: endoscopic ultrasonography, magnification endoscopy, chromoendoscopy, optical endoscopy, and capsule endoscopy
White Light Endoscopy

- Ileocolonoscopy
- Sigmoidoscopy
- Enteroscopy: Push/Double or Single Balloon/ Spiral Enteroscopy
- Gastroduodenoscopy
- Capsule Endoscopy: Small Bowel or Colon Capsule
Correct Diagnosis
Endoscopy

- Ileocolonoscopy: most important and potent tool in diagnosis of suspected IBD
- Endoscopy: direct visualization and obtaining of tissue
- No endoscopic features are specific for IBD but histopathological examination may help in correct diagnosis
- Flexible sigmoidoscopy with biopsy: Older age, severe disease, steroid use, female gender and endoscopic dilations
- Attempt to pass scope beyond inflamed segments
Endoscopic Findings of UC

- Inflammatory changes begin just above anorectal junction and spread proximally in continuous fashion.
- Clear demarcation between involved and normal areas.
- Earliest endoscopically visualized changes are erythema and vascular congestion of mucosa.
- As edema becomes prominent, small mounds form, resulting in granular appearance.
- Mucosa might be friable and bleed with minor contact.
- As inflammation become more severe, ulcerations form.
- Ulcers always surrounded by inflamed and abnormal mucosa.
Endoscopic Findings of UC

• Long standing disease:
  – loss of haustral folds and luminal narrowing
  – mucosal atrophy leads to pseudopolyps formation
  • swollen islands of edematous granulation tissue that can assume any shape as well as form mucosal bridges

None of these endoscopic features are specific for UC
Endoscopic Findings of Crohn’s Disease

- Skip lesions, cobblestoning, aphthous ulcers, longitudinal ulceration, ileocecal involvement, and anal lesions suggest Crohn disease
- Biopsies from ulcer edge and aphthous erosions are more likely to demonstrate granuloma than normal-looking or cobblestoned mucosa

None of these endoscopic features are specific for CD
Endoscopic Biopsy

• Can be decisive in achieving correct diagnosis
• Several precautions should be observed
• Utmost importance for pathologist to have access to patient’s clinical history and endoscopic findings
• Information regarding type of bowel preparation and drugs
  – Sodium phosphate purgatives can result in focal inflammation or aphthous lesions
  – NSAIDs can produce ischemic changes

Virchows Arch 2014, CGH 2007, 2005
Endoscopic Biopsy

- Dehydration can lead on to hypoperfusion of colon that might result in ischemic changes
- Multiple biopsies should be sampled from each region examined
- 4 biopsies should be sampled from each inflamed segment and an equal number from each uninflamed segment within reach
- Diagnostic yield is maximized by orienting sample
Endoscopic Biopsy

• Sample areas that are not completely denuded to evaluate residual crypt epithelial architecture

• Source of biopsy identified by anatomic segment:
  – Normal cecal mucosa is characterized by widely spaced crypts and relative abundance of mononuclear inflammatory cells
  – Paneth’s cells are normally limited to ascending colon
  – Biopsies of sigmoid might show IBD like inflammation if sampled from vicinity of diverticula
  – Mucosa approaching anorectal junction is distorted and IBD-like
Upper Gastrointestinal Endoscopy in IBD?

- Upper gastrointestinal (UGI) tract inflammation: increasingly recognized, even in absence of symptoms
- Involvement of stomach and the duodenum: up to 3% of adult patients with ileocolonic disease
- Pediatric population with IBD: UGI endoscopy mandatory as UGI involvement may reach up to 50%

*Curr Opin Gastro 2014, J Crohn Colitis 2013, CGH 2007, 2005*
Disease Activity and Extent
Introduction

- **Disease Activity:** Symptoms compatible with irritable bowel syndrome common in IBD patients in remission
- **Disease Extent:** Location of inflammation relevant for choice of drugs (systemic vs. topical)
- **Video capsule endoscopy:** valuable in symptomatic Crohn’s disease patients for evaluation of suspected small bowel lesions that are not visible on small bowel radiographs
- **Assessment of mucosal healing during therapy**

*J Crohn Colitis 2013, CGH 2007, 2005, Gastroenterology 2004*
Clinical, Endoscopic and histopathological parameters at presentation that predict the need for long-term immunosuppression in ulcerative colitis

Ranjit K. Sreerama, Puneet Chhabra, Vishal Sharma, Ritambhra Nada¹, Ravi Sharma, Chalapathi Rao, Rajesh Gupta², Lileswar Kaman², Surinder S. Rana, Deepak K. Bhasin

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metaplasia, and the presence of neuronal cells were similar in the two groups. Conclusion: Of the clinical, biochemical, endoscopic and histological features at presentation only the presence of pancolitis predicts the need for long term immunosuppressants in ulcerative colitis.
Newer Endoscopic Techniques
Limitations of Endoscopy

• Underestimates extent of disease compared to histology

• Assessment of inflammation activity is inaccurate in prediction of acute inflammation in some cases

• Surveillance of patients with ulcerative colitis consists of taking targeted and random biopsies
Dye Less Chromoendoscopy

- Virtual chromoendoscopy
- Optical chromoendoscopy or Filter based:
  - Narrow band imaging
- Post image acquisition techniques or Digital chromoendoscopy
  - i scan or FI CE
NBI in Ulcerative Colitis

Mildly Active Disease

Crypt opening type

Villous type

Dig Endoscopy 2011
NBI in Ulcerative Colitis

Inactive Disease

**Clear mucosal venous pattern (MVP)**

**Obscure MVP**

*Dig Endoscopy 2011*
NBI in Ulcerative Colitis

Inactive Disease

Honey Comb MVP

Irregular MVP

Dig Endoscopy 2011
Magnification Endoscopy

i-Scan Severe Ulcerative Colitis

Isc 1

iScan-2

zoom

Honeycomb vascular pattern

Isc 2

Zoom

IBD 2013
Capsule Endoscopy

- Advances in miniaturization and efficiency of semiconductor technology
- Technology of Future

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<th>MiroCam</th>
<th>OMOM</th>
<th>PillCam Colon 2</th>
<th>PillCam ESO2</th>
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Colonic lesions in patients undergoing small bowel capsule endoscopy

Surinder S. Rana • Deepak K. Bhasin • Kartar Singh
Confocal Laser Endomicroscopy

- Two types:
  - eCLE (endoscope-based CLE): measurement system integrated inside flexible endoscope
  - pCLE (probe-based CLE): measurement system introduced though operative channel of endoscope
Confocal Endoscopy in Ulcerative Colitis
Confocal Endoscopy in Ulcerative Colitis

Normal crypt • daisy

Blood cells in lamina propria vessels

Moderate activity of inflammation

Mild inflammation activity

WJG 2011
Confocal Endoscopy in Ulcerative Colitis
Confocal Endoscopy in Ulcerative Colitis
Confocal laser endomicroscopy for prediction of disease relapse in ulcerative colitis: A pilot study

Andrea Buda\textsuperscript{a,*}, Giorgia Hatem\textsuperscript{a}, Helmut Neumann\textsuperscript{f}, Renata D' Incà\textsuperscript{a}, Claudia Mescoli\textsuperscript{b}, Pierluca Piselli\textsuperscript{c}, John Jackson\textsuperscript{d}, Marco Bruno\textsuperscript{e}, Giacomo Carlo Sturniolo\textsuperscript{a}
Therapeutic Endoscopy
Therapeutic Endoscopy in IBD

• Endoscopic management of:
  – Strictures
  – Fistula
  – Perforations
  – Anastomotic leaks
  – Early cancers
Strictures

- Abnormal area of narrowing of intestinal lumen

**TABLE 2. Proposed classification of strictures in inflammatory bowel disease**

<table>
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<tr>
<th>Criteria</th>
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<tr>
<td>Etiology</td>
<td>Primary vs secondary (anastomotic); benign vs malignant</td>
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<tr>
<td>Number</td>
<td>Single vs multiple</td>
</tr>
<tr>
<td>Degree</td>
<td>High-grade vs low-grade</td>
</tr>
<tr>
<td>Shape</td>
<td>Web-like vs spindle-shaped; circumferential vs asymmetric</td>
</tr>
<tr>
<td>Length</td>
<td>Short vs long</td>
</tr>
<tr>
<td>Location</td>
<td>Esophagus, pylorus, small bowel, ileocecal valve anastomosis, colon, rectum, anus</td>
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<tr>
<td>Associated conditions</td>
<td>Fibrosis, edema, proximal dilation, ulceration, fistula with or without abscess, angulated, prior stricturoplasty</td>
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Strictures

• **Endoscopic management:**
  – Balloon dilatation
  – Intralesional steroid/ infliximab injection
  – Needle knife stricturotomy
  – Stent placement
Balloon Dilatation
Tubercular versus Crohn’s ileal strictures: role of endoscopic balloon dilatation without fluoroscopy

Surinder Singh Rana, Deepak Kumar Bhasin, Chalapathi Rao, Kartar Singh
Post Graduate Institute of Medical Education and Research (PGIMER), Chandigarh, India

What the new findings are:

- EBD using a 15 mm balloon without fluoroscopy is an effective, safe, and minimally invasive treatment modality for benign ileal strictures of various etiologies including both Crohn’s disease and tuberculosis
- Patients with Crohn’s disease needed more number of endoscopic sessions as compared to patients with tuberculosis
Needle knife stricturotomy
Dysplasia & Colorectal Cancer Surveillance

- Risk for CRC is increased in active and extensive disease, severe disease, longer disease duration, young age of onset, backwash ileitis, family history of CRC, and with concurrent PSC

- Annual surveillance:
  - after 8 years of disease duration for patients with extensive colitis
  - after 15 years for those with isolated left-sided disease or patchy colitis

IBD 2013, GCNA 2012, WJG 2011, BPRCG 2008
Dysplasia & Colorectal Cancer Surveillance

• High risk features (stricture or dysplasia detected within past 5 years, PSC, extensive colitis with severe inflammation or family history of CRC in first degree relative at <50 years): next surveillance colonoscopy scheduled for 1 year

• Intermediate risk factors: extensive colitis with mild or moderate active inflammation, post inflammatory polyps or family history of CRC in first degree relative at >50 years. Surveillance colonoscopy scheduled for 2 to 3 years

• No intermediate nor high risk features: next surveillance colonoscopy scheduled for 5 years

IBD 2013, GCNA 2012, WJG 2011, BPRCG 2008
Dysplasia & Colorectal Cancer Surveillance

- Endoscopically: dysplasia either flat or elevated
- Flat dysplasia difficult to detect macroscopically
- Four quadrant biopsies should be taken from every 10 cm of colon

*IBD 2013, GCNA 2012, WJG 2011, BPRCG 2008*
Contraindications and Complications

- Contraindications: toxic megacolon and severe colitis
- Complications: perforation, bleeding and sedation related complications

IBD 2013, GCNA 2012, WJG 2011, BPRCG 2008
Conclusions

• Endoscopy has a major role in diagnosis of IBD, assessment of its extent, treating strictures, assessing success of various treatments, and as predictor of disease course
• Ileocolonoscopy with biopsies is preferred procedure
• CE has a high positive predictive value in patients with suspected Crohn’s disease with normal capsule exam virtually excluding Crohn’s disease
• Device-assisted enteroscopy is a complementary tool in cases where there is need of biopsies or dilatation of strictures
• Newer imaging modalities especially confocal endoscopy holds considerable promise as tool for real time in vivo histology
Endoscopy in IBD: How Far One Can Go!

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Endoscopy is a very important tool in managing patients with inflammatory bowel disease. It plays an important role in achieving correct diagnosis, adequately assessing the extent as well as activity of the disease and plays an important role in effective cancer surveillance. Therapeutic endoscopy is also an important tool for avoiding surgery by effectively treating complications and early cancers by endoscopic interventions. Traditionally endoscopy has been done with white light endoscopy but recent advances like endoscopic ultrasonography, magnification endoscopy, chromoendoscopy, optical endoscopy, and capsule endoscopy have expanded the endoscopic armamentarium.

White light endoscopy is the most important investigation for achieving correct diagnosis of IBD by directly visualising the inflamed tissue as well as obtaining specimen for histological evaluation. Although none of the endoscopic features are specific for ulcerative colitis (IUC) or Crohn’s Disease (CD), but inflammatory changes beginning just above anorectal junction and spreading proximally in continuous fashion with clear demarcation between involved and normal areas suggests UC and presence of skip lesions, cobble stone appearance, aphthous ulcers, longitudinal ulceration, and anal lesions suggest CD. During ileocolonoscopy or sigmoidoscopy multiple biopsies should be taken from each region examined with at least 4 biopsies from each inflamed segment and an equal number from the normal segment within the reach. Newer imaging modalities especially confocal endoscopy holds considerable promise as tool for real time in vivo histology but further studies are needed before it can be incorporated in routine clinical practice.

Endoscopy is also an important tool for adequately assessing the extent as well as activity of the disease as the symptoms compatible with irritable bowel syndrome common in IBD patients in remission and endoscopy can help in differentiating the two. The location of disease is also important for deciding the route of administration. Capsule endoscopy (CE) is also an important tool for evaluating suspected small bowel lesions in Crohn’s disease patients that are not visible on small bowel radiographs/cross sectional imaging.

Endoscopic interventions can also effectively treat various complications like strictures, fistula, perforations, anastomotic leaks and early cancers and thus avoid surgery. The various endoscopic interventions available for treatment of strictures in IBD include balloon dilatation, intraslesional steroid/infliximab injection, needle knife stricturotomy and stent placement. Endoscopic polypectomy, mucosal resection and sub mucosal dissection are important therapeutic interventions for treatment of early colorectal cancers.

Endoscopy, although a safe technique is occasionally associated with complications like perforation, bleeding and sedation related complications. It should be avoided in patients with toxic megacolon and severe colitis to avoid complications.

Suggested reading: