When and How to use Chromoendoscopy in IBD

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# Patients’ Concerns About Ulcerative Colitis

<table>
<thead>
<tr>
<th>Primary concerns</th>
<th>Patients (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developing cancer</td>
<td>23</td>
</tr>
<tr>
<td>Uncertainty of disease progression</td>
<td>22</td>
</tr>
<tr>
<td>Losing bowel control</td>
<td>18</td>
</tr>
<tr>
<td>Energy level</td>
<td>12</td>
</tr>
<tr>
<td>Ostomy bag</td>
<td>8</td>
</tr>
<tr>
<td>Using steroids</td>
<td>7</td>
</tr>
<tr>
<td>Medication effects</td>
<td>5</td>
</tr>
<tr>
<td>Surgery</td>
<td>4</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
</tr>
</tbody>
</table>

Learning Objectives

• Understand the increased risk of CRC in IBD
  – Specific risk factors
  – Risk stratify for surveillance
• Recognize limitations of conventional colonoscopy and random biopsy
• Describe the indications for the usage of chromoendoscopy to detect dysplasia in patients with IBD

Take home points

• Increased risk of colon cancer in IBD
  – But, not as high as we used to think
  – Risk stratification

• Polyps in IBD patients: treat like non-IBD
  – Nomenclature: Paris classification, Border, ulcer

• Chromoendoscopy – Yes: increases yield
  May decrease incidence/mortality of CRC

• ASGE Guidelines, SCENIC Consensus

• Confirmed dysplasia = colectomy
  – HGD, endoscopically unresectable dysplasia
  – LGD* controversial
Risk of CRC in IBD is Less Than Previously Reported: Evidence of Successful Prevention?

- 48 studies included in the meta-analysis
- Included both population-based (259,266 person-years at risk) and referral center studies (29,799 patient-years at risk)
- Overall cumulative risk at 10, 20 and >20 years is 1%, 3% and 7%
- Rate higher in referral centers and in patients with extensive disease
- Risk is still almost 2x higher in Crohn’s and ulcerative colitis compared with general population

Cumulative Risk of CRC Among IBD Patients From Olmsted County, Minnesota, 1940-2001

CRC in patients with UC (n=378)
comparison with expected incidence from SEER data, Iowa whites, 1973-2000
(P=0.55, log rank).

25-year cancer risk: 2.0% (vs. 2.3%
expected based on Iowa SEER rates)
(P=0.55, log-rank test).

CRC in patients with CD (n=314)
comparison with expected incidence from SEER data, Iowa whites, 1973-2000
(P=0.66, log rank).

25-year cancer risk: 2.4% (vs. 1.6%
expected based on Iowa SEER rates)
(P=0.66, log-rank test).

Cancer Risk Factors in IBD

- Extensive disease
  - No increase in proctitis patients, intermediate risk in left sided UC and highest risk in pancolitis
- Disease duration/age at diagnosis
- Family history of colorectal cancer
  - Highest risk if FDR with CRC < 50
- Primary sclerosing cholangitis
- Histologic Disease activity
- Previous dysplasia
- Pseudopolyps, strictures, forshortened colon
- Probable risk factors
  - Poor compliance with medical therapy
  - Male Sex

Potential Relationship Between Chronic Inflammation and Risk of Colorectal Cancer in IBD

- 2004 analysis: the only risk factor for developing CRC in patients with long-standing, extensive UC was an increased histologic inflammation score (OR 4.69, 95% CI 2.10-10.48, \( P<0.001 \))
  - With macroscopically normal mucosa, 5-year cancer risk returned to level of general population\(^1,2\)

- 2007 study: prolonged histologic inflammation was a risk factor for progression to advanced neoplasia in patients with long-standing UC\(^3\)
  - Every unit increase in cumulative mean histologic inflammation score \(\rightarrow 3\)-fold increase in risk of advanced neoplasia\(^3\)

- 2013 case-control study: >3-fold increase in neoplasia with each 1-unit increase in histologic inflammatory activity score; risk increased to \(\geq 7\)-fold with higher degrees of inflammation\(^4\)

Cancer Surveillance in Colitis

Inflammation

Dysplasia

Cancer

Death

Initiate screening and surveillance

Intervention to prevent further progression: surgery
Is Surveillance Effective?

• Choi 1993: Patients who underwent surveillance presented with a significantly earlier stage of cancer
  – 5 year survival higher in surveillance group
• Karlen 1998: Relative CRC risk decline with increasing number of colonoscopies
• Eaden 2000: OR for CRC decreased with increasing number of colonoscopies
• Velayos 2006: OR for CRC decreased with increasing number of colonoscopies

Surveillance Colonoscopy in IBD

- Retrospective study of 6823 patients with IBD (2764 with a recent colonoscopy, 4059 without a recent colonoscopy) seen and followed for at least 3 years at 2 tertiary referral hospitals (MGH & BWH) in Boston, Massachusetts.
- The incidence of CRC among patients with and without a recent colonoscopy were 1.6% and 2.7% respectively (OR, 0.56; 95%, CI 0.39-0.80).
- Among patients with CRC, a colonoscopy within 6 to 36 months before diagnosis was associated with a reduced mortality rate (OR, 0.34; 95% CI 0.12-0.95).

Conclusion: A recent colonoscopy (within 36 months) is associated with a reduced incidence of CRC in patients with IBD, and lower mortality rates in those diagnosed with CRC.

Increased Risk of CRC in IBD

- Study of 55,008 Medicare patients, 15% of IBD patients with a diagnosis of CRC (2001-2005) had undergone surveillance colonoscopy in the previous 3 years.
- Compared with non-IBD patients, IBD patients were 3 times more likely (15.5% vs. 5.8%) to have had a colonoscopy within 6 to 36 months before the CRC diagnosis (CD: OR, 3.07; 95% CI, 2.23-4.21; UC: OR, 3.05; 95% CI, 2.44-3.81).
- 62.5% of CD and 38.5% of UC patients with interval CRC had advanced (stage III or IV) CRC at diagnosis.

Conclusions: dysplasia may be often missed or unrecognized with standard (old) colonoscopic surveillance techniques.

Biopsy Recommendations for Cancer Screening in IBD

- For patients with extensive disease, a minimum of 33 biopsies are recommended
  - 4-quadrant biopsies every 10 cm throughout the colon
  - Studies done pre HD scopes
- Evidence suggests that recommendations are frequently not observed

<table>
<thead>
<tr>
<th>Confidence</th>
<th>Dysplasia</th>
<th>Cancer</th>
<th>Dysplasia or Cancer</th>
</tr>
</thead>
<tbody>
<tr>
<td>90%</td>
<td>33</td>
<td>34</td>
<td>11</td>
</tr>
<tr>
<td>95%</td>
<td>56</td>
<td>64</td>
<td>18</td>
</tr>
</tbody>
</table>

- $2000 \text{cm}^2$ colon SA vs $1.32 \text{cm}^2$ random SA

33 random biopsies sample <0.1% of the bowel
Random Biopsies Taken During Colonoscopic Surveillance of Patients With Longstanding Ulcerative Colitis: Low Yield and Absence of Clinical Consequences

Frank J.C. van den Broek, MD, PhD, Pieter C.F. Stokkers, MD, PhD, Johannes B. Reitsma, MD, PhD, Robin P.B. Boltjes, Cyriel Y. Ponsioen, MD, PhD, Paul Fockens, MD, PhD and Evelien Dekker, MD, PhD

- 466 surveillance colonoscopies (167 pt)
  - 11,772 biopsies
  - 1 LGD = positive on random biopsies (all others were targeted biopsies)
- Rutter: 1/1266 random bx
- SCENIC:
  - 39/48,522 (0.08%)
  - 10% of dysplasia RB, 90% targeted

van den Broek *Am J Gastroenterol* 2011
Rutter MD. *J Gastroenterol*. 2011;46
Colectomy for Dysplasia in UC

- Low grade dysplasia → 20% cancer
- High grade dysplasia → 42% cancer
- DALM → 43% cancer
- The finding of dysplasia of any grade should be confirmed by a pathologist with special expertise in gastrointestinal pathology
- Confirmed dysplasia = colectomy

Bernstein et al, Lancet 1994;334:71
Progression of Neoplasia in UC: Chicago

- 35 patients in analysis
- 2 with IND and 2 with LGD developed HGD or CRC over mean duration of 49.8 months
- Incident rate for advanced neoplasia for all patients was 2.7 cases of HGD or CRC per 100 person-years at risk
- Conclusion: a low rate of progression to HGD or CRC in patients with LGD or IND under surveillance
  - Polypoid dysplasia showed less risk of progression than flat dysplasia

Kaplan-Meier curve of progression to high-grade dysplasia or colorectal cancer in patients with low grade or indefinite dysplasia.

IND=indefinite dysplasia

Fate of Dysplasia at Colectomy

<table>
<thead>
<tr>
<th>Ullman, 2003 Gastroenterology</th>
<th>Marion, 2016 CGH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dysplasia found with 10-20 random bx Low definition, White light</td>
<td>Dysplasia found with High definition WL &amp; Chromo</td>
</tr>
<tr>
<td>Colectomy performed</td>
<td>Colectomy performed</td>
</tr>
<tr>
<td>7/46 (15%) had synchronous CRC</td>
<td>0/10 (0%) had synchronous CRC</td>
</tr>
<tr>
<td>53% of the flat LGD by random bx → HGD or CRC over 5 years</td>
<td>Unknown if any of the LGD detected by Chromo would progress to HGD or CRC</td>
</tr>
<tr>
<td>Specificity: 15 +53= 68%</td>
<td>Specificity 0% so far</td>
</tr>
</tbody>
</table>

Dysplasia found by Chromoendoscopy is not the same as dysplasia found in earlier times by random biopsy and low definition. Chromo: Greater sensitivity for lower specificity

Marion JF, et al. CGH 2016;14:713-719
The Case for Chromoendoscopy
### Chromoendoscopy in Inflammatory Bowel Disease

Ralf Kiesslich, Markus F. Neurath, MD

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>Country</th>
<th>Dye</th>
<th>Staining</th>
<th>Endoscopy</th>
<th>Design</th>
<th>No. of pts.</th>
<th>Pts. with dysplasia</th>
<th>Outcome chromo vs. standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kiesslich et al.</td>
<td>2003</td>
<td>Germany</td>
<td>MB</td>
<td>Pancolonic</td>
<td>Magnification</td>
<td>Randomized 1:1</td>
<td>165</td>
<td>19</td>
<td>32 vs. 10 dysplastic lesions</td>
</tr>
<tr>
<td>Matsumoto et al.</td>
<td>2003</td>
<td>Japan</td>
<td>IC</td>
<td>Pancolonic</td>
<td>WLE</td>
<td>Prospective cohort</td>
<td>57</td>
<td>12</td>
<td>86% vs. 38% sensitivity</td>
</tr>
<tr>
<td>Rutter et al.</td>
<td>2004</td>
<td>UK</td>
<td>IC</td>
<td>Pancolonic</td>
<td>WLE</td>
<td>Prospective cohort</td>
<td>100</td>
<td>7</td>
<td>9 vs. 2 dysplastic lesions</td>
</tr>
<tr>
<td>Hurlstone et al.</td>
<td>2005</td>
<td>UK</td>
<td>IC</td>
<td>Targeted</td>
<td>Magnification</td>
<td>Prospective cohort</td>
<td>700</td>
<td>81</td>
<td>69 vs. 24 dysplastic lesions</td>
</tr>
<tr>
<td>Kiesslich et al.</td>
<td>2007</td>
<td>Germany</td>
<td>MB</td>
<td>Pancolonic</td>
<td>CLE</td>
<td>Randomized 1:1</td>
<td>153</td>
<td>15</td>
<td>19 vs. 4 dysplastic lesions</td>
</tr>
<tr>
<td>Marion et al.</td>
<td>2008</td>
<td>US</td>
<td>MB</td>
<td>Pancolonic</td>
<td>WLE</td>
<td>Tandem colonoscopy</td>
<td>102</td>
<td>19</td>
<td>17 vs. 3 patients with dysplastic lesions</td>
</tr>
<tr>
<td>Günther et al.</td>
<td>2011</td>
<td>Germany</td>
<td>IC</td>
<td>Pancolonic</td>
<td>CE</td>
<td>Randomized 1:1:1</td>
<td>150</td>
<td>6</td>
<td>6 (2+ CEM4) vs. 0 patients with dysplastic lesions</td>
</tr>
<tr>
<td>Hlavaty et al.</td>
<td>2011</td>
<td>Slovakia</td>
<td>IC</td>
<td>Pancolonic</td>
<td>CE</td>
<td>Tandem colonoscopy</td>
<td>30</td>
<td>4</td>
<td>4 vs. 2 dysplastic lesions</td>
</tr>
</tbody>
</table>
Chromoendoscopy: Which Dye?

- **Indigo carmine (0.03%-0.4%)**
  - Contrast stain neither reacts or is absorbed by the colonic mucosa
  - Pools in mucosal grooves allowing better definition of small or flat lesions as well as alterations in mucosal architecture
  - Can be washed off the mucosa

- **Methylene blue (0.04-0.2%)**
  - Vital dye taken up by colonic mucosa within 1-2 minutes staining noninflamed mucosa but is poorly taken up by dysplastic tissue or inflamed mucosa

- **No published studies comparing indigo carmine to methylene blue in patients with IBD. Other dyes: FD&C#2 Blue**

Pit Pattern Classification (Kudo)

The typical crypt architecture of types I-V are indicated (A). (B) Examples of type I (left) and type IV (right) lesions before and after chromoendoscopy.

Kiesslich, R et al. Gut 2004;53:165-167
Chromoendoscopy Videos
Chromoendoscopy: pseudopolyps
Adenoma found in a sea of pseudopolyps
Chromo with IC using flushing device
Chromoendoscopy: pt with longstanding Crohn’s colitis
Can one do chromoendoscopy in a busy clinical practice?

- Time: not an issue (Flusher, targeted biopsies. But schedule for 1 hour)
- Training (15-20 cases); online resources
- Technique: Flusher vs spray catheter
- Does it work in a private practice: yes!
- 2005: started: recorded on op note whether lesion seen with chromo or not
  - Selection bias in patients chosen for Chromo
Chromoendoscopy in practice

• Single physician experience 2005-8/2012
• 184 scopes; 118pts, mean age 51.4 years

Chromo - IC (64 scopes) WLE (120 scopes)
38.8 minutes 20.5 minutes
42.0 bx (13 jars) 34.8 bx (10 jars)
157 polyps (2.45/scope) 87 polyps (0.725/scope)
25/64 (39.1%) dys polyps 8/120 (6.9%) dys polyps
(p<0.001)

*flat dysplasia on one random biopsy: doing well, no colectomy, annual colonoscopy with chromo since


Is it recommended?

- BSG, ECCO, ESGE, CAG, APAG, JGES: endorse Chromo as preferred!
- CCFA/ASGE/AGA: endorse chromoendoscopy
- SCENIC CONSENSUS STATEMENT
- ACG: not enough data to endorse
  - Ok to do if have expertise, HD scope with random biopsies ok too
  - Though increase in yield of dysplastic lesions, does this translate to less cancer (Dr Peter Higgins). Need to show decrease in CRC/mortality
Two non-profit charitable foundations (Maxine and Jack Zarrow Family Foundation and the William Warren Foundation), provided unrestricted gifts supporting the guideline development process.
Dysplasia is either “visible” or “invisible”
### TABLE 1. Terminology for reporting findings on colonoscopic surveillance of patients with inflammatory bowel disease (modified from Paris Classification)

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visible dysplasia</td>
<td>Dysplasia identified on targeted biopsies from a lesion visualized at colonoscopy</td>
</tr>
<tr>
<td>Polypoid</td>
<td>Lesion protruding from the mucosa into the lumen $\geq$ 2.5 mm</td>
</tr>
<tr>
<td>Pedunculated</td>
<td>Lesion attached to the mucosa by a stalk</td>
</tr>
<tr>
<td>Sessile</td>
<td>Lesion not attached to the mucosa by a stalk; entire base is contiguous with the mucosa</td>
</tr>
<tr>
<td>Nonpolypoid</td>
<td>Lesion with little ($&lt; 2.5$ mm) or no protrusion above the mucosa</td>
</tr>
<tr>
<td>Superficial elevated</td>
<td>Lesion with protrusion but $&lt; 2.5$ mm above the lumen (less than the height of the closed cup of a biopsy forceps)</td>
</tr>
<tr>
<td>Flat</td>
<td>Lesion without protrusion above the mucosa</td>
</tr>
<tr>
<td>Depressed</td>
<td>Lesion with at least a portion depressed below the level of the mucosa</td>
</tr>
<tr>
<td>General descriptors</td>
<td></td>
</tr>
<tr>
<td>Ulcerated</td>
<td>Ulceration (fibrinous-appearing base with depth) within the lesion</td>
</tr>
<tr>
<td>Border</td>
<td></td>
</tr>
<tr>
<td>Distinct border</td>
<td>Lesion’s border is discrete and can be distinguished from surrounding mucosa</td>
</tr>
<tr>
<td>Indistinct border</td>
<td>Lesion’s border is not discrete and cannot be distinguished from surrounding mucosa</td>
</tr>
<tr>
<td>Invisible dysplasia</td>
<td>Dysplasia identified on random (non-targeted) biopsies of colon mucosa without a visible lesion</td>
</tr>
</tbody>
</table>

SCENIC Nomenclature

- It is recommended that the terms dysplasia-associated lesion or mass (DALM) and adenoma-like or non-adenoma-like DALM be abandoned
- Use the preferred term “endoscopically resectable” which indicates that:
  - distinct margins of the lesion could be identified
  - the lesion appears to be completely removed on visual inspection after endoscopic resection
  - histologic examination of the resected specimen is consistent with complete removal
  - biopsy specimens taken from mucosa immediately adjacent to the resection site are free of dysplasia on histologic examination
- All other lesions are “endoscopically unresectable”

<table>
<thead>
<tr>
<th>Endoscopic appearance</th>
<th>Description**</th>
<th>Definition</th>
<th>Paris class***</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Polyoid</strong></td>
<td>Pedunculated</td>
<td>Lesion attached to mucosa by a stalk</td>
<td>Ip</td>
</tr>
<tr>
<td></td>
<td>Sessile</td>
<td>Lesion not attached to mucosa by a stalk: entire base is contiguous with mucosa</td>
<td>Is</td>
</tr>
<tr>
<td>Non-polyoid</td>
<td>Slightly elevated</td>
<td>Lesion with protrusion but &lt; 2.5 mm above mucosa</td>
<td>Ila</td>
</tr>
<tr>
<td></td>
<td>Flat</td>
<td>Lesion without protrusion above mucosa</td>
<td>Iib</td>
</tr>
<tr>
<td></td>
<td>Depressed</td>
<td>Lesion with at least a portion depressed below the level of mucosa</td>
<td>Iic</td>
</tr>
</tbody>
</table>

ASGE Guidelines

• All patients with UC or Crohn’s colitis are recommended to undergo a screening colonoscopy 8 years after disease onset to (1) re-evaluate extent of disease and (2) initiate surveillance for colorectal neoplasia (Grade: Moderate)

• Surveillance colonoscopy is recommended every 1 to 3 years beginning after 8 years of disease in patients with UC with macroscopic or histologic evidence of inflammation proximal to and including the sigmoid colon and for patients with Crohn’s colitis with greater than one-third of colon involvement (Grade: Moderate)

ASGE: How to Perform Surveillance

- **Chromoendoscopy** with targeted biopsies is recommended as the preferred surveillance technique to maximize dysplasia detection (Grade: Moderate)

- Chromoendoscopy-targeted biopsies are sufficient for dysplasia surveillance in patients with IBD and that consideration should be given to taking two biopsies from each colon segment for histologic staging to assess extent and severity of inflammation (Grade: Low)

- **Random biopsies** with targeted biopsies of any suspicious appearing lesions remain a reasonable alternative for dysplasia surveillance if the yield of chromoendoscopy is reduced by significant underlying inflammation, significant pseudopolyposis, or poor preparation or if chromoendoscopy is not available (Grade: Low)

ASGE: After Polypectomy

- Patients with IBD whose polypoid dysplastic lesions have been removed completely receive endoscopic surveillance at 1 to 6 months and at 12 months, with yearly surveillance thereafter (Grade: Moderate)

- Patients with IBD whose non-polypoid dysplastic lesions have been removed completely receive endoscopic surveillance at 1 to 6 months and at 12 months, with yearly surveillance thereafter (Grade: Low)

- Proctocolectomy in patients with IBD if a detected lesion is not endoscopically resectable, if there is evidence of dysplasia at the base of the lesion, or if endoscopically invisible HGD or multifocal LGD is found in the colon during a high-quality chromoendoscopy examination (Grade: Moderate)
SCENIC: Detection of Dysplasia on Surveillance Colonoscopy

- **High definition** is recommended rather than standard definition colonoscopy (*Strong recommendation*)

- **Chromoendoscopy** is recommended rather than standard-definition white-light colonoscopy (*Strong recommendation*)

- **Chromoendoscopy** is suggested rather than white-light colonoscopy when performing surveillance with high-definition colonoscopy (*Conditional recommendation*)

- **Narrow band** is not recommended as alternative to standard definition or high definition white light endoscopy or chromoendoscopy (*Conditional recommendation*)

SURFACE: guidelines chromo

- Strict patient selection.
- Unmask the mucosal surface.
- Reduce peristaltic waves.
- Full length staining of the colon.
- Augmented detection with dyes.
- Crypt architecture analysis.
- Endoscopic targeted biopsies.

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Technique</th>
<th>Method</th>
<th>Dilution*</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesion detection</td>
<td>Pan chromo-endoscopy</td>
<td>Water jet channel using auxiliary foot pump or biopsy channel using spray catheter</td>
<td>Indigo carmine (0.8%, 5ml ampule): 2 ampules + 250ml water (0.03%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Methylene blue (1%, 10ml ampule): 1 ampule + 240ml water (0.04%)</td>
<td></td>
</tr>
<tr>
<td>Lesion characterization and delineation of borders</td>
<td>Targeted chromo-endoscopy</td>
<td>Syringe spray through biopsy channel</td>
<td>Indigo carmine (0.8%, 5ml ampule): 1 ampule + 25ml water (0.13%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Methylene blue (1%, 10ml ampule): 1 ampule + 40ml water (0.2%)</td>
<td></td>
</tr>
</tbody>
</table>

*Various dilutions ranging from 0.03-0.2% of indigo carmine and methylene blue have been reported for panchoendoendoscopy.

What I Do: Chromo for all IBD Surveillance. Targeted biopsies

- In our AEC: 0.1% IC (food coloring grade)
  - Mixed that morning of in 1 liter H2O.
  - Clean further on way in.
  - Flusher starting in the cecum, panchromoendoscopy by section. Suction pools carefully
  - No significant inflammation. Targeted biopsies only. I book 45 min. (usually takes me 30 min)
- 0.02% MB in hospital (One 10ml vial of MB in 500 cc sterile water)
  - Otherwise same protocol
  - If IC available, Soetikno protocol
  - 1hour booking in hospital
- Wear scrubs and old sneakers(otherwise your clothes will be stained blue!)
Chromo in Practice

Mix to 0.1% to 0.4%
Chromo in the Hospital
Should You Continue to Obtain Random Biopsies When Using Chromoendoscopy?

• Continue random biopsies in high risk patients such as those with PSC or a previous history of dysplasia.
• Use random biopsies as alternative to CE or in patients with poor prep and/or multiple pseudopolyps.
• Continue to take several biopsies to document extent and severity of disease.
Invisible Dysplasia

If “invisible” dysplasia is detected and confirmed by a second expert pathologist, management must be individualized and is dependent on:

- Low grade dysplasia vs high grade dysplasia
- Unifocal vs multifocal
- Patients risk factors (PSC, duration and extent of disease, FH of CRC, etc)
- Patient preferences

Summary: Management of Dysplasia

- Dysplasia should be confirmed by a second expert pathologist
- Polypoid and nonpolypoid dysplasia can be managed endoscopically if the lesion can be completely resected and there is no adjacent invisible dysplasia; otherwise, surgery is required
- Advanced endoscopic techniques may be needed for resection and referral to an experienced endoscopist
Endoscopy Resources


Google: youtube ASGE Chromoendoscopy
A Paradigm Shift: BLUE
FOR A CLEARER VIEW

Just Published in Gastroenterology and GIE:
SCENIC* International Consensus Statement on Surveillance and Management of Dysplasia in Inflammatory Bowel Disease

*Surveillance for Colorectal Endoscopic Neoplasia Detection and Management in Inflammatory Bowel Disease Patients: International Consensus Recommendations

Development Committee: Loren Laine, Tonya Kaltenbach, Alan Barkun, Kenneth R. McQuaid, Venkatakrishnan Subramaniam, Roy Siegel


Endorsed worldwide by: the American Gastroenterology Association, American Society for Gastrointestinal Endoscopy, the Asian Pacific Association of Gastroenterology, British Society of Gastroenterology, Canadian Association of Gastroenterology, European Society of Gastrointestinal Endoscopy, and Japan Gastroenterological Endoscopy Society

Free Online Resources for implementation in Practice:
Learning Video (2014 ASGE Audio Visual Award)
Chromoendoscopy With Targeted Biopsy to Detect Nonpolypoid Colorectal Neoplasia in IBD
Tonya Kaltenbach, Kenneth R. McQuaid, Andrea Sanchez-Yague, Sarah K. McGR, and Roy Siegel
https://www.youtube.com/watch?v=QAW8gswt0BI

Book and Atlas
Nonpolypoid Colorectal Neoplasms in Inflammatory Bowel Disease
Gastrointestinal Endoscopy Clinics of North America, July 2014
Tonya Kaltenbach and Roy Siegel, editors
http://www.gi.fronline.com/d/issues/S1055-5157/14/09003-6

Algorithm for Practice
The Detection of Nonpolypoid (Flat and Depressed) Colorectal Neoplasms in Patients With Inflammatory Bowel Disease
# Post SCENIC Studies

<table>
<thead>
<tr>
<th>Author/year</th>
<th>Study Period</th>
<th>Study Design</th>
<th>Cohort</th>
<th>Dysplastic Lesions</th>
<th>Bottom Line</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choi</td>
<td>2002-2012</td>
<td>Retrospective</td>
<td>Surveillance</td>
<td>267</td>
<td>CE Superior</td>
</tr>
<tr>
<td>UK, 2015</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>95 (78 UC)</td>
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Chromoendoscopy superior to Standard in Long Term Surveillance

Figure 3. Kaplan-Meier. Negative targeted (white light or methylene blue) examination on index examination and follow-up.
Ashwin Says "Chromo is Better"

EDITORIAL

Chromoendoscopy Is Better: So Why Am I Not (yet) Using it for Routine Inflammatory Bowel Disease Surveillance?

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British Society Guidelines 2010

Screening colonoscopy at 10 years
(preferably in remission, pancelonic dye-spray)

**Lower Risk**
Extensive colitis with NO ACTIVE endoscopic/histological inflammation
OR left-sided colitis
OR Crohn’s colitis of <50% colon

5 Years

Pancolonic dye spraying with targeted biopsy of abnormal areas is recommended, otherwise 2–4 random biopsies from every 10 cm of the colorectum should be taken

**Intermediate Risk**
Extensive colitis with MILD ACTIVE endoscopic/histological inflammation
OR post-inflammatory polyps
OR family history CRC in FDR aged 50+

3 Years

**Higher Risk**
Extensive colitis with MODERATE/SEVERE ACTIVE endoscopic/histological inflammation
OR stricture in past 5 years
OR dysplasia in past 5 years declining surgery
OR PSC / transplant for PSC
OR family history CRC in FDR aged <50

1 Year

Other Considerations
Patient preference, multiple post-inflammatory polyps, age and comorbidity, accuracy and completeness of examination

FDR, first-degree relative; PSC, primary sclerosing cholangitis

Pre-existing risk factors to consider: extent of colonic involvement, years of disease, previous endoscopic and histologic severity of inflammation, FH of CRC at young age (<50), presence of pseudopolyps, previous history of LGD or indefinite for dysplasia, presence of stricture(s), PSC, and male gender.

Post colonoscopy risk factors to consider: Degree and extent of endoscopic/ histologic inflammation, presence and extent of pseudopolyps, finding and number of dysplastic polyps completely removed, finding of LGD or indefinite for dysplasia in a random or targeted biopsy, and dysplastic lesion(s) not completely removed.

Colectomy: invasive cancer, unresectable polypoid dysplasia of any grade, Flat HGD found on random biopsy, residual unresectable dysplastic tissue of any grade at follow-up, multifocal HGD on biopsy.

*Isolated LGD can be monitored with close surveillance after discussion of risks, benefits including option of colectomy. Dysplasia of any grade and indefinite for dysplasia should be reviewed by second expert GI pathologist.
Pilot studies have demonstrated that methylated DNA markers (BMP3, Vimentin, EYA4, NDRG4) can be detected in stool of IBD patients with dysplasia or CRC. DNA Chip: N=338, ROC=0.93, Sensitivity 92%, Specificity 94%

Chemoprevention

- Equivocal data on folic acid, 5-ASA
- Emerging data on Statins
- 47% ↓ CRC (95% CI: 26-62%)
- 94% ↓ IBD-CRC (n=55) (95% CI: 45-99%)
- Atorvastatin induces apoptosis in CRC cells, slows colon tumor xenograft growth in mice

Chemoprevention

- 11,001 IBD patients Boston area from 1998-2010, CRC diagnosis validated
- 1376 pts (12.5%) on statins vs 9,625 not
- Controlled for age, gender, smoking, PSC, CRP, ESR, surveill colonoscopy within 3 yr
- Statin use associated with 58% reduction in IBD-CRC (95% CI: 38-72%)
  - 2% of statin users developed CRC
  - 3% of nonstatin users developed CRC

Summary

• The absolute risk of CRC in IBD is limited
• Stratify for high risk: Extensive disease, long duration, uncontrolled inflammation, FH of CRC and patients with PSC carry a greater risk of CRC
• To prevent IBD related CRC, the goal is to minimize severity and extent of inflammation, whereas the methods used to do this (regular follow-up, medical treatment, chemoprevention, surveillance, and surgery) act in common and not as single cancer-preventive factors
• Random biopsies have extremely low yield
• Chromoendoscopy detects more dysplasia than HD white light endoscopy
• We need prospective data that chromoendoscopy prevents development of CRC in IBD patients
Why Chromoendoscopy?

- Increases yield of important findings
- No increased risk
- Safe, easy to learn and perform
- Takes more time*: but isn’t your patient worth it? Don’t you take your time on screening colons for high ADR?
- Potential for cost saving (less frequent scopes, no need for random biopsies) Important in the MACRA/MIPS era!
- Should be standard for surveillance in IBD (in my opinion). Negative chromocolonoscopy associated with good long term colectomy free survival
- Long term data needed. Risk stratify with Stool DNA? Chemoprevention with statins?

*Increased time is negligible if stop random biopsies and use flusher